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MUNICIPAL AND INDUSTRIAL WATER SUPPLY AND WATER QUALITY CONTROL STUDY, TALLAHALA CREEK WATERSHED, JONES COUNTY, MISSISSIPPI

Public Health Service
Atlanta, Georgia

December 1965

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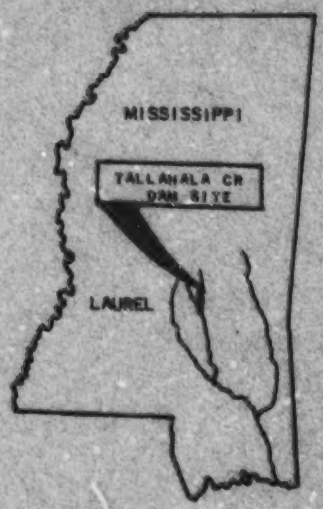
MUNICIPAL AND INDUSTRIAL WATER SUPPLY AND WATER QUALITY CONTROL STUDY

TALLAHALA CREEK WATERSHED

JONES COUNTY, MISSISSIPPI



U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Public Health Service, Region IV
Atlanta, Georgia

DECEMBER 1965

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MUNICIPAL AND INDUSTRIAL WATER SUPPLY AND WATER QUALITY CONTROL STUDY TALLAHALA CREEK WATERSHED JONES COUNTY, MISSISSIPPI

Abstract

The results of the study show a need for storage for municipal and industrial water supply and water quality control in the proposed reservoir. These conclusions are based on economic, demographic and engineering studies. Future needs are based on projected population and industrial growth.

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Prepared for
U. S. Army Corps of Engineers
Mobile District

U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
PUBLIC HEALTH SERVICE, REGION IV
DIVISION OF WATER SUPPLY AND POLLUTION CONTROL
SOUTHEASTERN COMPREHENSIVE WATER POLLUTION CONTROL PROJECT
ATLANTA, GEORGIA

December 1965

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INTRODUCTION

AUTHORITY

In a letter dated December 17, 1964, the U. S. Army District Engineer, Mobile District, requested the Public Health Service, Region IV office, to conduct water supply and water quality control studies for the proposed Tallahala Creek Reservoir Project. The project is located in Jasper County near the City of Laurel, Mississippi.

The study was made as part of the comprehensive basin study of the Pascagoula Basin being conducted jointly by the Department of the Army, Department of Interior, Department of Agriculture, Department of Commerce, Federal Power Commission, Department of Health, Education, and Welfare, and the States of Alabama, Louisiana, and Mississippi. This joint study is being coordinated by the Department of the Army through its Corps of Engineers, Mobile District. The Department of Health, Education, and Welfare is participating in this study through its Southeastern Comprehensive Water Pollution Control Project, which is headquartered in the Division of Water Supply and Pollution Control, Region IV, Atlanta, Georgia.

The study was made in accordance with: (1) a Memorandum of Agreement between the Department of the Army and the Department of Health, Education, and Welfare, dated November 4, 1958, relative to the Title III of the Water Supply Act of 1958 as amended (43 USC 390b); and (2) the Federal Water Pollution Control Act as amended (33 USC 466b(b)).

PURPOSE AND SCOPE

Determination of the need for and value of storage for municipal and industrial water supply and water quality control in the proposed Tallahala Creek Reservoir was the purpose of this study. The study period was taken as fifty years, the economic life of the project; and determinations of the total amount of storage required as well as the value of this stored water for its extended uses were made to the year 2015. The site of the proposed reservoir is in Jasper County near Laurel, Mississippi, on Tallahala Creek, which is a tributary of the Leaf River (Figure 1 at back of report).

ACKNOWLEDGEMENTS

Information and assistance were obtained from the following agencies and is gratefully acknowledged: The U. S. Army Corps of Engineers, Mobile District; the U. S. Geological Survey, Ground and Surface Water Branches, Jackson; the Mississippi State Board of Health; the Mississippi State Game and Fish Commission; the City of Laurel; various Laurel industries and firms; and other Federal, State, County, and local agencies.

The economic base study made of the Pascagoula River Basin by Michael Baker, Jr., Inc., under contract with the Corps of Engineers, Mobile District, was used in making the economic studies and projections contained in this report.

SUMMARY AND CONCLUSIONS

SUMMARY

1. The location of the proposed reservoir is on Tallahala Creek, in Jasper County, nine miles north of Laurel, Mississippi, and 82 miles above the confluence with the Leaf River.

2. Two study areas have been considered: one for evaluation of water supply needs, and one for water quality control needs. The water supply study area includes all of Jones County. The water quality study area includes the interrelated areas of Jasper, Jones, Forrest, Simpson, Covington, Lamar, George, and Jackson Counties.

3. Major water users and waste dischargers in the study areas are the City of Laurel and its associated industries, including a very large wood products mill.

4. Present water use is supplied from ground water and is estimated at 5.5 mgd for municipal purposes and 9.6 mgd for industries of which 7.3 mgd is for the major water-using mill. Both the City of Laurel and its industries have experienced considerable declines in their ground water levels due to the high rates and localized pumping of their aquifers.

5. Rural sections of the study area are served by ground water which appears adequate.

6. Stream surveys were conducted in the study area during the winter (February-March) and summer (June-August) periods of 1965 to aid in determination of water requirements for quality maintenance.

Emphasis was placed on the dissolved oxygen (DO) and biochemical oxygen demand (BOD) parameters; however, other pertinent chemical and bacteriological data were collected from study area streams.

7. Based on the surveys conducted, the present municipal and industrial waste loads entering Tallahala Creek from the Laurel area are estimated to vary from 25,000 lbs/day of 5-day BOD (during the summer survey) to 2,000,000 lbs/day (during the winter survey). Both surveys showed that Tallahala Creek water was of good quality above waste sources; however, downstream from the Laurel area, the stream was found to be in a depressed oxygen condition during both the winter and summer periods.

CONCLUSIONS

1. Total population in the water supply study area is projected to increase from 59,542 in 1960 to 110,600 in 2015. Of this, the urban and rural-nonfarm population is projected to increase from 52,748 in 1960 to 108,000 in 2015. Industrial development is expected to increase at the same rate, e.g., manufacturing employment is projected to increase from 5,900 in 1960 to 13,100 in 2015.

2. By the year 2015, municipal and industrial water requirements are expected to increase to an average daily demand of 45 mgd. Rural water requirements are expected to remain at approximately their present level.

3. With the existing situation of declining water levels in the Laurel-Jones County area, a new source of either ground water or surface water supply is needed to meet both present and projected future demands.

4. The annual present value of water supply storage in the proposed Corps of Engineers project designed to supply an average of 45 mgd is estimated as a minimum of approximately $164,000.

5. Recommended water quality in Tallahala Creek is based on the provision of a well rounded, warm water fishing habitat. This will require the maintenance of 4.0 milligrams per liter (mg/l) of dissolved oxygen in the stream.

6. With adequately treated municipal and industrial wastes discharged to Tallahala Creek from the Laurel area to a level of no more than 10,000 pounds of 5-day BOD per day, base flows (the minimum of monthly mean flows occurring once in ten years) are not sufficient to maintain the desired water quality. Therefore, there is a need for storage in the proposed reservoir for streamflow regulation.

7. An estimated draft on storage of 13,650 acre-feet per year will maintain water quality at the recommended levels. Releases would vary monthly and should be controlled through use of a water quality monitoring system. To assist in the planning for the design and operation of this reservoir, a monthly minimum water requirement schedule for water quality control has been determined.

8. The present value of storage for water quality control was estimated by the least cost alternative method as a minimum of approximately $233,000 annually. Because of the large number of persons benefited and the extensive areas in which they are located, benefits have been considered as widespread.

9. The discharge of wastes in excess of 10,000 pounds per day of 5-day 20^{o} BOD will be possible provided the rate of discharge is regulated to avoid exceeding the assimilative capacity of the stream.

DESCRIPTION OF PROJECT

RESERVOIR SITE LOCATION

The proposed site for the Tallahala Creek dam is on Tallahala Creek, [illegible] miles north of Laurel, Mississippi and 82 miles above its confluence with the Leaf River (Figure 2 - back of report). The dam and reservoir would be in Jasper County and would control runoff from 152 square miles or 70 percent of the Tallahala Creek drainage area above Laurel. The purpose of the dam is to control floods in the downstream reaches of Tallahala Creek and to provide storage for municipal and industrial water supply purposes for the Laurel area.

STREAM CHARACTERISTICS

Tallahala Creek rises near the Jasper-Newton County line, north of Laurel, Mississippi, and drains an area of about 650 square miles in Jasper, Jones, Forrest, and Perry Counties. The basin has a maximum length of 70 miles and an average width of 12 miles. The creek, which is about 105 miles long, has a fall of about 2.2 feet per mile. The channel ranges from 50 to 130 feet in width and has a bank height of 15 to 30 feet.

Tallahala Creek flows in a general southerly direction from its headwaters to its mouth. Its principal tributary is Tallahoma Creek with confluence just above Ellisville. The stream channel is 50 to 130 feet wide and has a bankfull capacity ranging from 1250 cfs to 5750 cfs in the middle and lower reaches, respectively. The minimum, maximum, and average flows of record of Tallahala Creek at Laurel are 2.5; 10,100; and 211 cfs, respectively.

Tallahala Creek is a principal tributary of the Leaf River, which joins the Chickasawhay River to form the Pascagoula River. The Pascagoula River flows to the Gulf of Mexico.

WATER QUALITY

Field surveys were conducted in the Tallahala Creek sub-basin during the winter (February-March) and summer (June-August) periods of 1965. The results of these surveys are contained in Appendix 2.

The quality of the upstream waters of both Tallahala and Tallahoma Creeks was found to be generally suitable for most uses, including water supply, with chlorination, and recreation. Downstream from the municipal and industrial waste discharges of the Laurel area, however, water quality in Tallahala Creek was degraded to the point where all uses except waste disposal are precluded.

PERTINENT PROJECT DATA

Pertinent data for the proposed Tallahala Creek project is summarized below:

Drainage area (sq. mi.)	152
Maximum spillway design pool elevation (ft.)	335
Reservoir area at spillway crest (acres)	11,850
Total volume at spillway crest (ac. ft.)	270,000
Length of dam (ft.)	8,000

DESCRIPTION OF STUDY AREA

LOCATION AND BOUNDARIES

For the purposes of this report, two study areas were considered; one for municipal and industrial water supply, and one for water quality control (Figures 3 and 4). The base for their selection was that they are the hydrologic and economic areas benefited by storage in the proposed reservoir for these respective purposes.

The water supply study area is Jones County. It includes all the urban, non-farm centers of population in the county. The water quality control study area is located in Jasper, Jones, Forrest, Simpson, Covington, Lamar, George, and Jackson Counties. The boundary for this study area follows the Tallahala Creek watershed boundary from the proposed dam to the mouth of Tallahala Creek, the Leaf River boundary from Tallahala Creek to the Pascagoula River, and the Pascagoula River boundary from the Leaf River to the Pascagoula Bay. It is to be noted, however, that storage requirements for water quality control in the proposed reservoir have been based on waste discharges from the Laurel-Jones County area and that the intensive benefit area is Tallahala Creek below this discharge point.

While the stream survey discussed in Appendix 2 showed that Tallahala Creek had essentially recovered before it joined the Leaf River, analysis of the data indicated that quality in the Leaf River could be adversely affected under more critical conditions of flow,

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NOXUBEE CO.
SUQUALENA
LAUDERDALE CO.
WAYNE CO.
HEIDELBERG
PAULDING
SANDERSVILLE
LAUREL
PHILADELPHIA
DEKALB
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JASPER CO.
MONTROSE
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ATTALA CO.
SMITH CO.
ZAMA
CENTER
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PINEVILLE
TAYLORSVILLE
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KOSCIUSCO
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LUDLOW
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MADISON CO.
SCOTT CO.
RANKIN CO.
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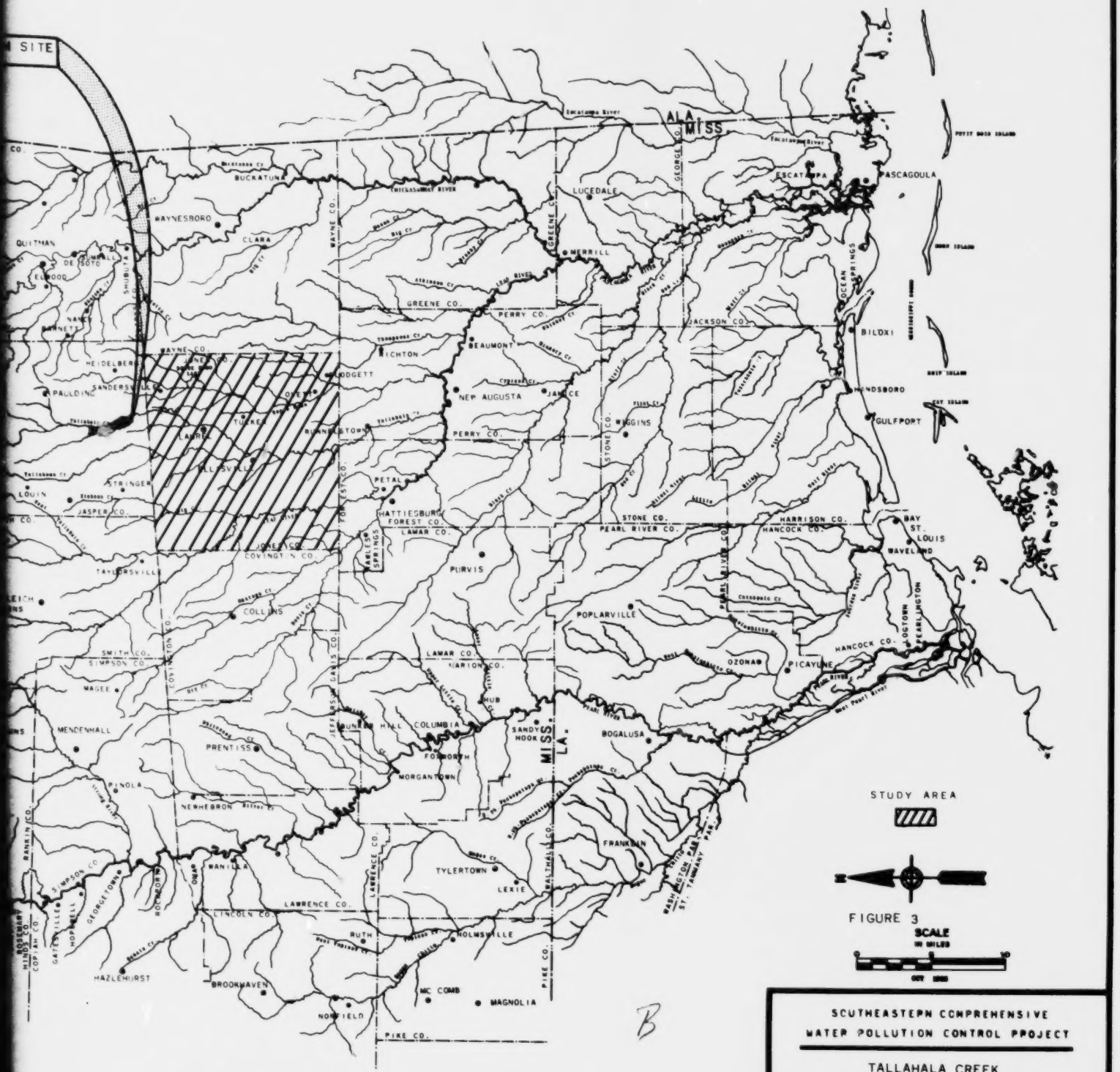
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STUDY AREA
FIGURE 3
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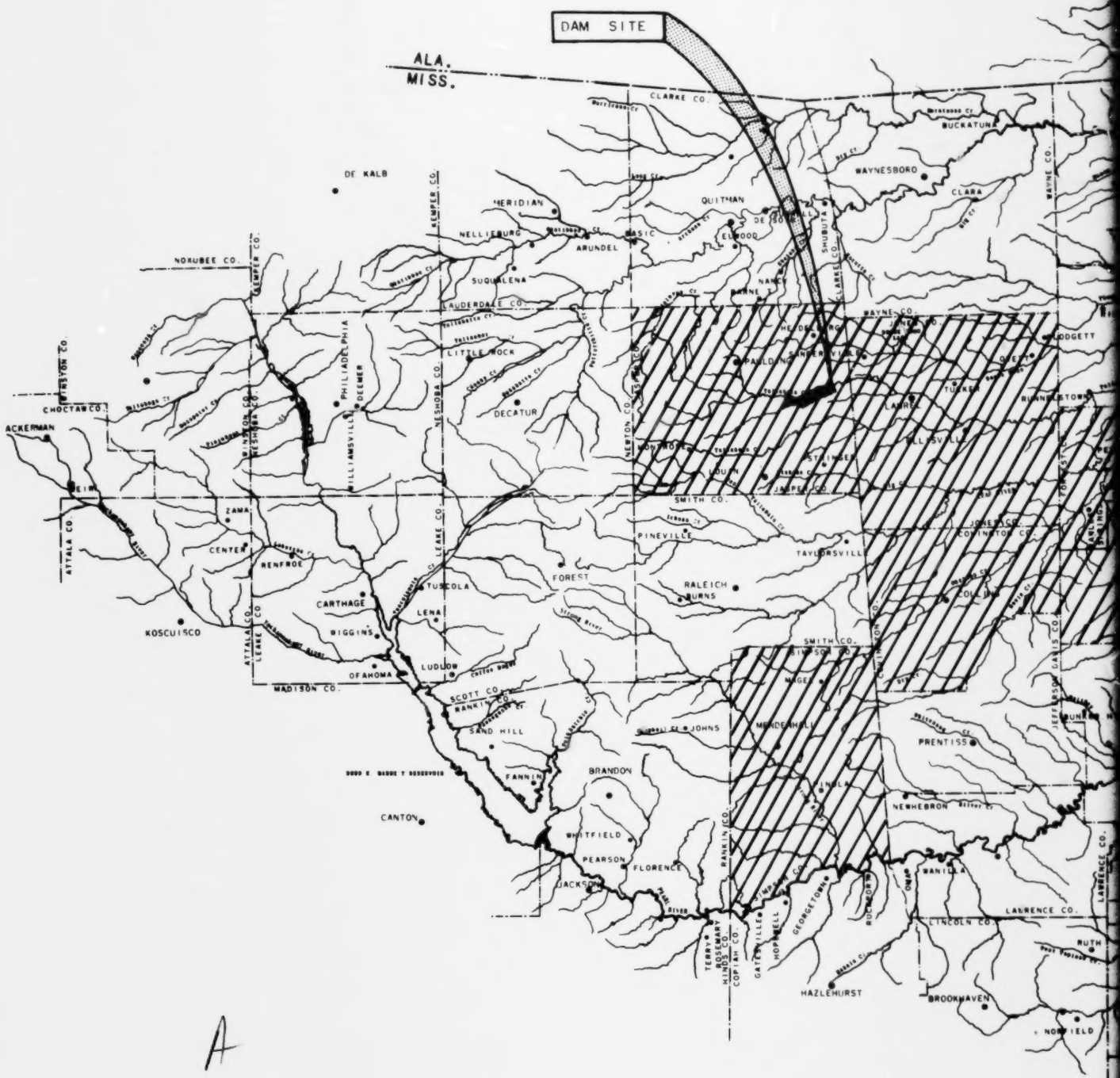
SOUTHEASTERN COMPREHENSIVE
WATER POLLUTION CONTROL PROJECT
TALLAHALA CREEK
MUNICIPAL AND INDUSTRIAL
WATER SUPPLY STUDY AREA
U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Public Health Service
REGION IV
ATLANTA, GEORGIA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RANKIN CO.
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FANNIN
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WHITFIELD
PEARSON
FLORENCE
JACKSON
PEARL RIVER
SMITH CO.
PINEVILLE
FOREST
RALEICH
BURNS
TAYLORSVILLE
JASPER CO.
JONES CO.
COVINGTON CO.
FORREST CO.
JEFFERSON DAVIS CO.
MAGEE
MENDENHALL
PRENTISS
NEWHEBRON
WANILLA
LAWRENCE CO.
LINCOLN CO.
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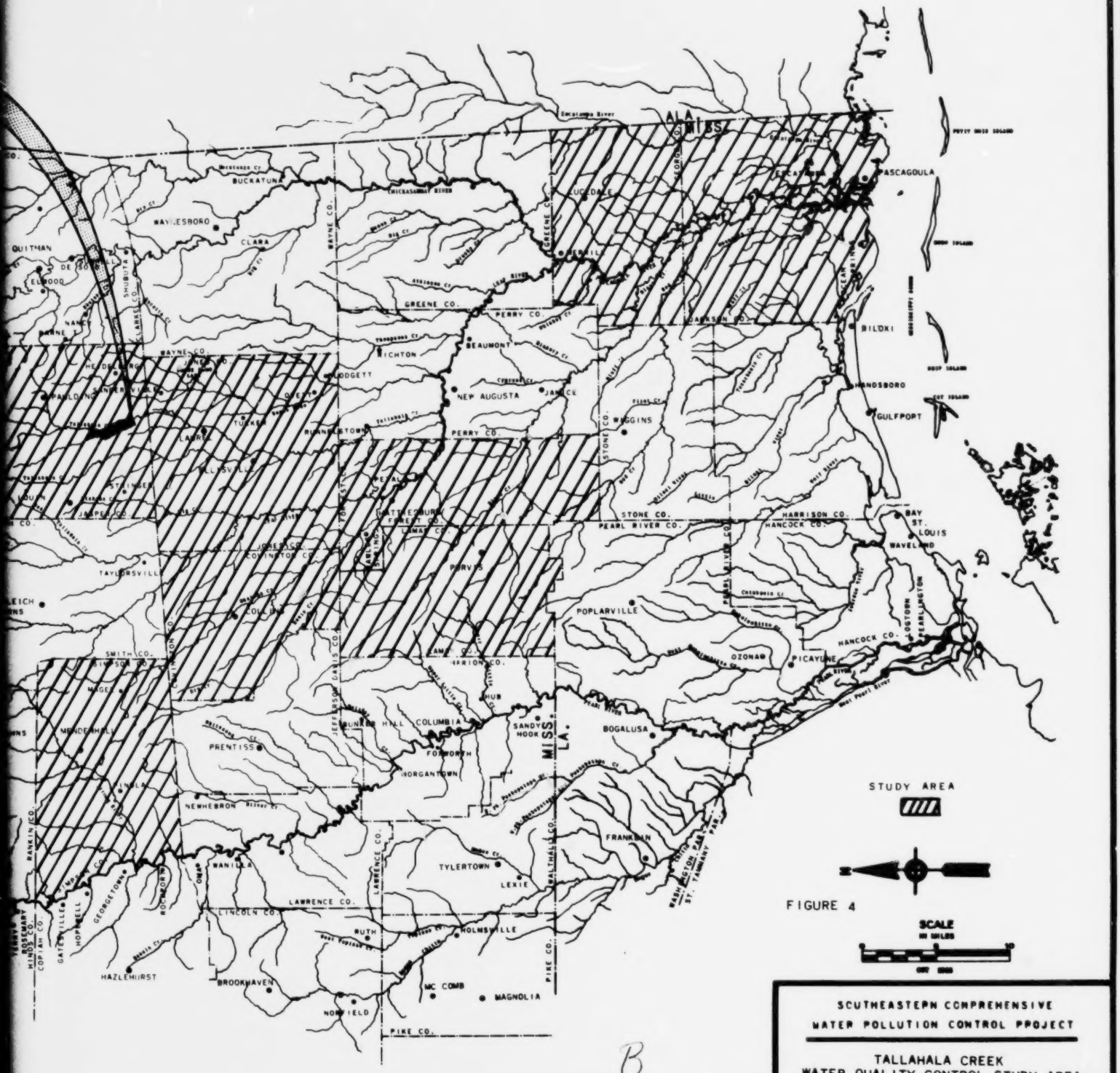
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CLARA
QUITMAN
ELLISVILLE
LAUREL
PRENTISS
COLUMBIA
SANDY HOOK
BOGALUSA
POPLARVILLE
PICAYUNE
OZONA
FRANKLIN
TYLERTOWN
LEXIE
MAGNOLIA
MC COMB
BROOKHAVEN
HAZLEHURST
NEWHEBRON
WANILLA
MONTICELLO
MENDENHALL
TAYLORSVILLE
NEW AUGUSTA
WIGGINS
PERRY CO.
GREENE CO.
STONE CO.
PEARL RIVER CO.
HARRISON CO.
HANCOCK CO.
LAWRENCE CO.
LINCOLN CO.
PIKE CO.
SMITH CO.
JONES CO.
COVINGTON CO.
MARION CO.
FORREST CO.
WAYNE CO.
JACKSON CO.
STUDY AREA
FIGURE 4
SCALE
SOUTHEASTERN COMPREHENSIVE
WATER POLLUTION CONTROL PROJECT
TALLAHALA CREEK
WATER QUALITY CONTROL STUDY AREA
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ATLANTA, GEORGIA

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temperature, and waste loads. Therefore, the study area was extended to include the lower Leaf and the Pascagoula Rivers (see section on benefits).

GEOGRAPHY AND CLIMATE

The Tallahala Creek basin lies within the North Central Plateau physiographic region which is part of the East Gulf Coastal Plain. The topography of this region is characterized by gently rolling hills.

The study area climate is temperate and humid with short, mild winters and long, warm summers - typical of the Gulf Coast region. Severe cold spells are infrequent and freezing temperatures are of short duration.

Rainfall within the basin is heavy and, in general, evenly distributed throughout the year. The average annual precipitation at Laurel is about 58 inches.

Extreme temperatures reported at Laurel for the summer, winter, and the annual mean have been 106, 7, and 66° F, respectively. The average growing season is 233 days.

PRINCIPAL COMMUNITIES AND INDUSTRIES

The municipality of Laurel, Mississippi, is the predominant urban area in the Tallahala Creek basin. In 1960, the census population of Laurel was 27,890 (almost all of which is sewered). Downstream from Laurel, the only other community of significance is Ellisville, which had a 1960 census population of 4,592 (about 3/4 of which is sewered). Other communities in the sub-basin have neither community water supply or sewage disposal systems.

Water-using industries in the study area are a wood products mill in Laurel with a 1960 employment of about 3,300 people, a dairy products plant (110 employees), a poultry processing plant (130 employees) and a hosiery plant (100 employees). (See Economics Section.)

WATER RESOURCES

SURFACE WATER

Tallahala Creek is an uncontrolled stream and flows are extremely variable. Flows at Laurel have ranged from a minimum of 1.8 cfs to a maximum of 13,700 cfs and at Runnelstown, further downstream, flows have ranged from 32 to 19,300 cfs (Table 1). Streamflow records for Tallahoma Creek are available only for the period 1941-48. During this period the minimum observed discharge was 2.2 cfs, with an average of 233 cfs.

TABLE 1

SUMMARY OF HISTORIC STREAMFLOWS
TALLAHALA CREEK

Location	Drainage Area (sq. mi.)	Period of Record	Instantaneous Flows (Annual) cfs		
			Max.	Min.	Average
Laurel	233	1938-60	13,700	1.8	314
Runnelstown	612	1939-60	19,300	32	833

Analyses of low flows were made and are presented in Appendix 1. As shown in these analyses, the minimum daily 1 in 10 year flow at Laurel was 2.5 cfs, and the minimum 7-day 1 in 10 year flow was 3.5 cfs. Low flow analyses by months are also presented in Appendix 1.

Water uses of Tallahala Creek are presently limited to the transport of municipal and industrial wastes. Upstream from these discharge points, the water of Tallahala Creek is of suitable quality

for most uses. During the water quality survey conducted as part of this study, data collected showed the water in the vicinity of the proposed dam site to be of good quality (Appendix 2). During both the winter and summer, total hardness at Stations 1 and 2 (see Figure 2) ranged from 12 to 88 mg/1; alkalinity from 8 to 38 mg/1; and chlorides from 2 to 221 mg/1. Selected grab samples showed iron and manganese to be low (0.01 and 0.008 mg/1, respectively), total solids low (148 to 1,110 mg/1), and color low (60 to 125). The only quality parameter found to be in excess of acceptable levels for Type III municipal water supply was total coliform. Total coliform ranged from 940 to greater than 160,000 MPN per 100 ml at Stations 1 and 2 -- a range normally experienced in uncontrolled streams in the area. It is expected that impoundment of this headwater stream will reduce both the fluctuation and the level of the bacterial content by increasing both detention time and the water available for dilution.

GROUND WATER

At the present time all major municipal and industrial water users depend on ground water for their sources of supply. The Miocene beds (specifically the Catahoula sandstone) are considered the main aquifer from which this water is supplied. These beds range from 1500 to 2000 feet in thickness; and, in the Laurel area, they are found at depths of 250 to 450 feet below the land surface.

Because of the demands for municipal and industrial water supply in the Laurel area, the ground water level of the existing supply has been steadily decreasing. The U. S. Geological Survey

reports a decline of over 15 feet in the ground water table since 1950 in the Laurel area. It is estimated that this decline will continue under present usage at the rate of one foot per year.

Below the Miocene beds is the Clairborne group, which is located about 750 feet below the land surface in the Laurel area. This group furnishes practically all existing ground water supplies in the area north of Laurel-Jones County (Newton and Lauderdale Counties) where it outcrops.

Water from both the Miocene and Clairborne aquifers has good to excellent quality. Grab samples from wells in the Laurel and Jones County area show that, at depths of greater than 100 feet, the waters are chiefly the sodium bicarbonate type; low in calcium carbonate hardness, iron, chlorides, and dissolved solids (Appendix 3). The waters in shallower aquifers (less than 100 feet) usually contain excessive iron concentrations and require treatment to make it suitable for most municipal and industrial uses.

THE ECONOMY

INTRODUCTION

The demand for water for municipal and industrial purposes and the amount and character of waste waters resulting from such uses, are determined largely by the activities associated with the area's economic base. The purpose of this section is to present economic and demographic data to be used as a basis for projecting the needs for water for municipal and industrial purposes and for estimating the future amounts and types of waste that may be expected to occur in the Tallahala Creek sub-basin with an expanded development anticipated in the future.

Economic and demographic projections made of the Leaf River and Coastal Sub-Areas of the Pascagoula River Basin by Michael Baker, Jr., Inc., under contract with the Corps of Engineers, Mobile District, were utilized to the fullest extent possible in making this study. Because their data are presented in a series of three volumes which have been widely distributed and are still available, aggregated data available in them are not reproduced in this report. Reference is made instead to the report, where appropriate.

In the disaggregation of Michael Baker report data, data and information from the U. S. Census Bureau, representatives of concerned Federal agencies, Mississippi State University, and Michael Baker, Jr., Inc. were used to estimate projections of population and employment in specific urban and industrial centers.

Data from the "Mississippi Manufacturers Directory," 1963 and 1964, and the "Mississippi Industrial Directory," 1958, were used to locate manufacturing industries geographically as well as to provide some information relative to current growth, as measured by employment, by specific plants as well as by certain pertinent industry groupings. Industry groupings are according to the Standard Industrial Classification Code. Annual data provided by the Masonite Corporation, Laurel Plant, which comprises the only other major external source of information, was used to project the water requirements of this plant.

ECONOMIC SUB-AREAS

As discussed previously, two study areas were considered in this report; one covering the potential water supply area, the other the water quality control area. The economic sub-areas considered included these two areas plus several others which are economically related to them and which affect or will be affected by the proposed project.

Tallahala Creek and its tributaries provide the central drainage for Jasper and Jones Counties, Mississippi. The cities of Laurel and Ellisville are centrally located within its drainage basin. Tallahala Creek has its confluence with Leaf River a few miles downstream from Hattiesburg, Mississippi, which is itself located at the confluence of Bowie and Leaf Rivers. Magee, Mississippi, located on one of the upper reaches of Okatoma Creek (a major tributary of Bowie River) in Simpson County, and Collins,

Mississippi, located on a central reach of Okatoma in Covington County, show a considerable demand for both in-place and withdrawal uses of water now and an even greater potential in the future. Waters from the Okatoma Creek-Bowie River drainage area enter the Leaf River only a few miles above its confluence with Tallahala Creek. Water needs at Heidelburg and Sandersville in the Bogue Homo Creek basin are currently comparatively small, but indications are that future needs in this area could be significant. Bogue Homo Creek drains into Leaf River a few miles downstream from its confluence with Tallahala Creek. No other significant population or industrial centers use the waters of the Pascagoula River Basin above the confluence of the Leaf and Chickasawhay Rivers which form the Pascagoula River many miles downstream from the Tallahala Creek basin. There are currently no major population or industrial centers located on the Pascagoula River upstream from the city of Pascagoula, Mississippi, which is located on the Gulf Coast. However, the rapid growth of the Pascagoula-Gulfport-Biloxi complex indicates a future need for much greater use of waters along the Pascagoula River main stem. Consequently, counties watered by the Pascagoula main stem are included in this study.

Review of the preceding statement will show that the following Mississippi counties, population, and industrial centers are specifically considered in this economic study of streams and stream reaches directly or indirectly affected by developments within the Tallahala Creek Basin: (1) counties include Jasper, Jones, Simpson, Covington, Forrest, Lamar, George, and Jackson; (2) population and industrial centers include Laurel, Ellisville,

Magee, Collins, Heidelberg, Sandersville, and Pascagoula; and (3) streams or stream reaches include Tallahala Creek, Okatoma Creek-Bowie River, Bogue Homo Creek, and the Pascagoula River main stem.

CURRENT AND FUTURE ECONOMIC DEVELOPMENT

General

In the Michael Baker study it was assumed that water quality and quantity will not be a restriction on economic growth. This same assumption was used in the projections contained in this report.

Tallahala Creek and its tributaries provide the central drainage for Jasper and Jones Counties, Mississippi. The cities of Laurel and Ellisville are centrally located within its drainage area. Approximately 87 percent of the population is urban and rural non-farm with only 13 percent rural farm. Principal industries are lumber and wood products manufacturing, the processing of food products, manufacture of wearing apparel and agriculture. There is some indication that the crude petroleum production and refining industry along with natural gas and related mining industries, may become important to the area's economy. The service industries are composed chiefly of wholesale, retail, financial and professional services.

Current and future populations of the counties involved have been estimated and are presented in Tables A and B in Appendix 4. These population estimates indicate that the urban and industrial

sectors of the economy of all of these areas are expected to grow rapidly, with most rapid growth centering around Pascagoula. The Hattiesburg and Laurel areas are expected to grow at a slower pace, but both are expected to more than double their populations within the next 50 years. The rural-farm population is expected to decline severely in all areas.

Total employment, number of households, and personal income indicated through analysis of Michael Baker data have been estimated and are given in Table C, Appendix 4. Projection of these parameters confirms the population estimates made. It will be noted that the economic parameters tend to increase more rapidly than population with the passage of time. This is especially noticeable in the case of personal income, a rough measure of total demand for goods and services.

Employment is shown by place of residence. If developed by place of work, because of worker commuting patterns, employment would be slightly lower than shown for the Jasper-Jones and Simpson-Covington-Lamar-Forrest areas and higher than shown for the George-Jackson County area. However, data available indicate that this factor is not significant.

Specific Urban and Industrial Centers by Economic Sub-Areas

Jasper-Jones County Area -(Tallahalla Creek Watershed)

There are essentially only two major water using urban and industrial centers in this area at the present time, Laurel and Ellisville. Masonite Corporation, located near Laurel, is the largest water user and the major single employer of industrial

workers in the area (accounting for about half of the area's total manufacturing employment in 1964 as indicated by data summarized from the 1964 Mississippi Manufacturers Directory). Summaries from the Census of Population show that the corporate population of Laurel increased from 18,017 in 1930 to 24,889 in 1960, and the population of Ellisville from 2,127 to 4,592. These growth rates are somewhat different in magnitude but are in the same direction and close to the same magnitude as projected for the Tallahala area as a whole.

Manufacturing employment and related data by place of work and by individual company, available from publications of and made available through the Mississippi Research and Development Center, were utilized to determine total manufacturing employment for 1958, 1963, and 1964 for each of the urban and industrial centers within the area considered to be either currently or potentially significant. These data, combined with data from other sources, have been utilized to estimate 1960 (base year) employment by 4-digit (SIC) industry groups and for all manufacturing industries (SIC Division D). Michael Baker estimates of rates of growth for the sub-area in which located provided the basis for projected size of each group presented. For the Tallahala Creek area, total manufacturing employment by place of work (with the principal activity centering around Laurel) is given in Table D, Appendix 4, for total manufacturing and for each of the principal water-using industry groups considered to be currently or potentially significant.

The Michael Baker Report has Masonite classified in SIC 4-digit group 2661 (Building paper and building board mills). This report places it in SIC 2499 in accordance with the Mississippi Manufacturers Directory Classification (1963 and 1964 issues). As a consequence of this difference and in view of Michael Baker's introduction of about 200 paper mill employees into the Leaf River Sub-Area employment projections in 1980, it is possible that a portion of the 4,000 (year 1980) and 8,000 (year 2015) employees will be employed in the pulp and paper industry instead. This, however, should make no great difference in water requirements.

Simpson-Covington-Lamar-Forrest County Area (Okatoma Creek-Bowie River Watershed)

Magee, Mississippi, with a 1930 population of 964 and a 1960 population of 2,039, and Collins, Mississippi, with a 1930 population of 935 and a 1960 population of 1,537, are the only significant water users in this area. This significance is largely because of the growth of the poultry products industry in the area with plants located within or near these two population centers. Employment in meat packing plants located in Magee was reported as declining by 28 employees between 1958 and 1964. Estimates of employment for this area are given in Table E, Appendix 4.

Hattiesburg (Upper Leaf River Watershed)

Hattiesburg (including Petal in 1960) had a 1930 population of 18,601 and a 1960 population of 38,996 (34,989 without Petal). Manufacturing industry employment has been estimated and is presented in Table F, Appendix 4.

Gum and wood chemicals (2861) is the major water-using industry in the area. Most of the employment in this industry is currently accounted for by one company, Hercules Powder. Dixie Pine Products Company is another large company currently producing gum and wood chemicals.

Heidelberg-Sandersville (Bogue Homo Creek Watershed)

Heidelberg had a population of 653 in 1930 and 1,049 in 1960, and Sandersville had a population of 565 in 1930 and 657 in 1960. The only significant water-using industry in the area during the 1958 to 1964 period was a petroleum refinery reported as employing 57 people in 1958 and 50 in 1964. This plant was located at Sandersville. There appears, however, to be a real potential for some additional development in the future in Sandersville. Total manufacturing employment accounted for only a little more than 90 employees in 1960, more than half of which were employed in petroleum refining and related activities.

The only other center located in the upper reaches of Leaf River which currently shows signs of becoming significant to the water use problem is Bay Springs, located in the upper reaches on Etehoma Creek, a tributary to Big Creek. Bay Springs had a 1930 population of 927 and of 1,544 in 1960. Its total employment in manufacturing amounted to about 650 in 1960, and close to 100 of these were employed in poultry processing. Available information shows an employment of 85 in 1958, 100 in 1964, and only 75 in 1965 (primary data source for 1965). There is no reliable indication of

employment of about 2,000 in 1964; 1,650 of whom were employed by the pulp and paper industry (SIC Code 2621, International Paper Company). Fish meal industries (SIC Code 2094) accounted for 235 of the 1964 employees at Moss Point, and synthetic rubber (SIC Code 2822) accounted for 70. These are all in the principal water-using industries group, indicating the current need for water in the area and pointing toward an even greater potential need in the future.

MUNICIPAL AND INDUSTRIAL WATER REQUIREMENTS

PRESENT WATER USES

At the present time, all municipal and industrial water supplies in the study area are obtained from groundwater sources. The City of Laurel obtains water from ten deep wells. Present water use is estimated to be 5.5 mgd. The major industrial water user in the study area is the Masonite Corporation plant which obtains its supply of 7.3 mgd from 21 deep wells. The other industrial water users in the Laurel area are principally food processing plants which use about 2.3 mgd from groundwater sources (Table 2).

Ellisville, which obtains its supply from three deep wells, uses an estimated 0.26 mgd which includes industrial uses.

There is a small amount of agricultural water use in the area, most of which is supplied from ground water.

EXISTING SUPPLIES

Ground water in the study area is over committed. High and continuous rates of use have resulted in a steady fall in the area's water level. As previously discussed, the water table has been steadily declining at the rate of about one foot per year and is expected to continue this rate at present withdrawal uses.

Deeper aquifers (some 750 feet below the surface) in the area have not been tapped. The U. S. Geological Survey has stated: "Available information indicates that as much as 45 million gallons per day of ground water could be developed within 10 miles of Laurel with properly spaced wells and well fields."[1/] Domestic

[1/] Correspondence from District Chief, USGS, Jackson, Mississippi.

TABLE 2
BASIC DATA ON MUNICIPAL AND INDUSTRIAL WATER SUPPLY SYSTEMS
TALLAHALA CREEK SUB-BASIN
MISSISSIPPI

Municipality Or Industry	Population or Employment	Source	Treatment	Design Capacity mgd	Storage mgd	Average Demand mgd
Ellisville	4,592	3 deep wells	None	1.87	x	.26
Laurel	27,890	10 deep wells	Aeration Chlorination Fluoridation	8.0	2.14	7.8 1/
Wood Products Plant	3,400	21 deep wells	None	x	x	7.3
Dairy	x	1 deep well	x	x	x	x

1/ Includes industrial water uses not listed separately.

x Data not Available

supplies for rural areas are adequate for present and projected future needs. Quality of both the existing ground water supplies and the deeper supplies is, with some minor exceptions, adequate for most municipal and industrial uses.

FUTURE MUNICIPAL AND INDUSTRIAL WATER REQUIREMENTS

The results of the economic and demographic studies show approximate doubling for the study area's population and industrial growth by 2015. This increase in growth will result in a proportional increase in the water demand for municipal and industrial purposes for the area. Increase in municipal demand will result from additional population, as well as an increase of per capita water use from its present level of 100 gallons per day to 125 gallons per day in 1980 and to 150 gallons per day in 2015. Industrial water demand will increase in proportion to increased production and employment. Inasmuch as economic data on production were not available for all the industries, except Masonite, the study area future industrial water demands were estimated based on projected employment and per employee water use. Production and water use data provided by the Masonite Corporation were used to estimate future water demand for this plant. This comprises the major portion of the demand estimated for pulp, paper, and wood products.

It is expected that, if surface water is used as the source of supply for the urban areas of the watershed, a single source, treatment and distribution system will be used.

Based on the above assumptions, the results of the demographic and industrial projections found in the Economics Section of the report and Appendix 4, the following projections of municipal and industrial water use have been made.

MUNICIPAL WATER USE - JONES COUNTY

Year	Urban Non-Farm Population [1]	Per Capita Use gpcpd	Total Mun. Use mgd
1960	52,748	100	5.2
1965	55,800	100	5.5
1980	66,800	125	8.5
2015	108,000	150	16.0

[1] Includes Ellisville, Laurel, Sandersville, and other concentrations of population in Jones County.

INDUSTRIAL WATER USE (PULP, PAPER, AND WOOD PRODUCTS)

Year	Employees	Production 1000 sq. ft.	Water Use gal/unit	Total Water Use mgd
1960	3211	990,780	6.32	6.3
1965	3493	1,145,485	6.32	7.3
1980	4311	1,609,600	6.31	10.0
2015	6318	2,692,535	6.27	17.0

INDUSTRIAL WATER USE (FOOD PROCESSING) [1]

Year	Employees	Water Use [2] 1000 gal/emp/yr.	Water Use 1000 gal/yr.	Total Water Use mgd
1960	530	1204	640,000	1.7
1965	720	1210	870,000	2.3
1980	1290	1340	1,730,000	5.0
2015	2320	1900	4,370,000	12.0

[1] Includes plants in Standard Industrial Code (SIC) 20.
[2] From Water Resources Activities in the United States, Print No. 8, Senate Select Committee on National Water Resources.

TOTAL MUNICIPAL AND INDUSTRIAL WATER DEMANDS
MGD

Year	Municipal	Industrial		Total
		Wood Products	Food Proc.	
1960	5.2	6.3	1.7	13.2
1965	5.5	7.3	2.3	15.1
1980	8. 5	10.0	5.0	23.5
2015	16. 0	17.0	12.0	45.0

WATER QUALITY CONTROL REQUIREMENTS

GENERAL

The use of water for municipal and industrial purposes will almost inevitably result in the production of some liquid wastes which, even after a high degree of treatment, could degrade the quality of the receiving stream. It is essential that recognition be given to the need for flows which must be maintained in the receiving stream if the quality of these waters is to be kept at levels acceptable to State agencies. This need has been recognized in the construction of Federal reservoirs in certain provisions of the Federal Water Pollution Control Act, as amended (33 USC 466 b (b)). Under Section 3 of this Act, in the survey or planning of a reservoir by any Federal agency, consideration must be given to the inclusion of storage for regulation of streamflow for the purpose of water quality control. The Act expressly states that any such storage and water releases shall not be provided as a substitute for adequate treatment or other methods of controlling wastes at their sources. Based on stream surveys conducted by the Southeastern Comprehensive Water Pollution Control Project in the winter and summer of 1965, assimilative capacity, waste loadings, and other environmental factors were determined and estimates of streamflows needed to improve and protect water quality have been made (sample computation in Appendix 2).

PRESENT WASTE DISCHARGES

Ellisville, Mississippi

The Ellisville sewerage system presently serves about 79 percent of the city. It is estimated that, of the 1960 population of 4,592, about 3,500 persons are served by the system. The system has three separate outfalls, all discharging to Tallahala Creek. Wastes from about 1,500 persons are discharged without treatment directly to Tallahala Creek about one half mile downstream from the junction of Tallahala and Tallahoma Creeks. Wastes from about 1,050 persons are discharged to a septic tank which gives little treatment and from there to Rocky Creek, a tributary of Tallahala Creek. Wastes from the remaining 1,000 persons are discharged to a lagoon which does provide adequate treatment for these wastes. Effluent from the lagoon also discharges into Rocky Creek about four miles upstream from its confluence with Tallahala Creek.

The only major water-using industry in Ellisville is a meat packing house which discharges organic wastes to a small branch of Rocky Creek.

Laurel, Mississippi

The Laurel sewerage system serves essentially all of the population of the city (27,800 persons). The system has five separate outfalls, four of which discharge into Tallahala Creek and one into Tallahoma Creek. Wastes from about 1,000 people are treated by a lagoon which provides 85 percent reduction of BOD. Wastes from about 12,000 people plus industrial organic wastes (mainly food processing) having a population equivalent

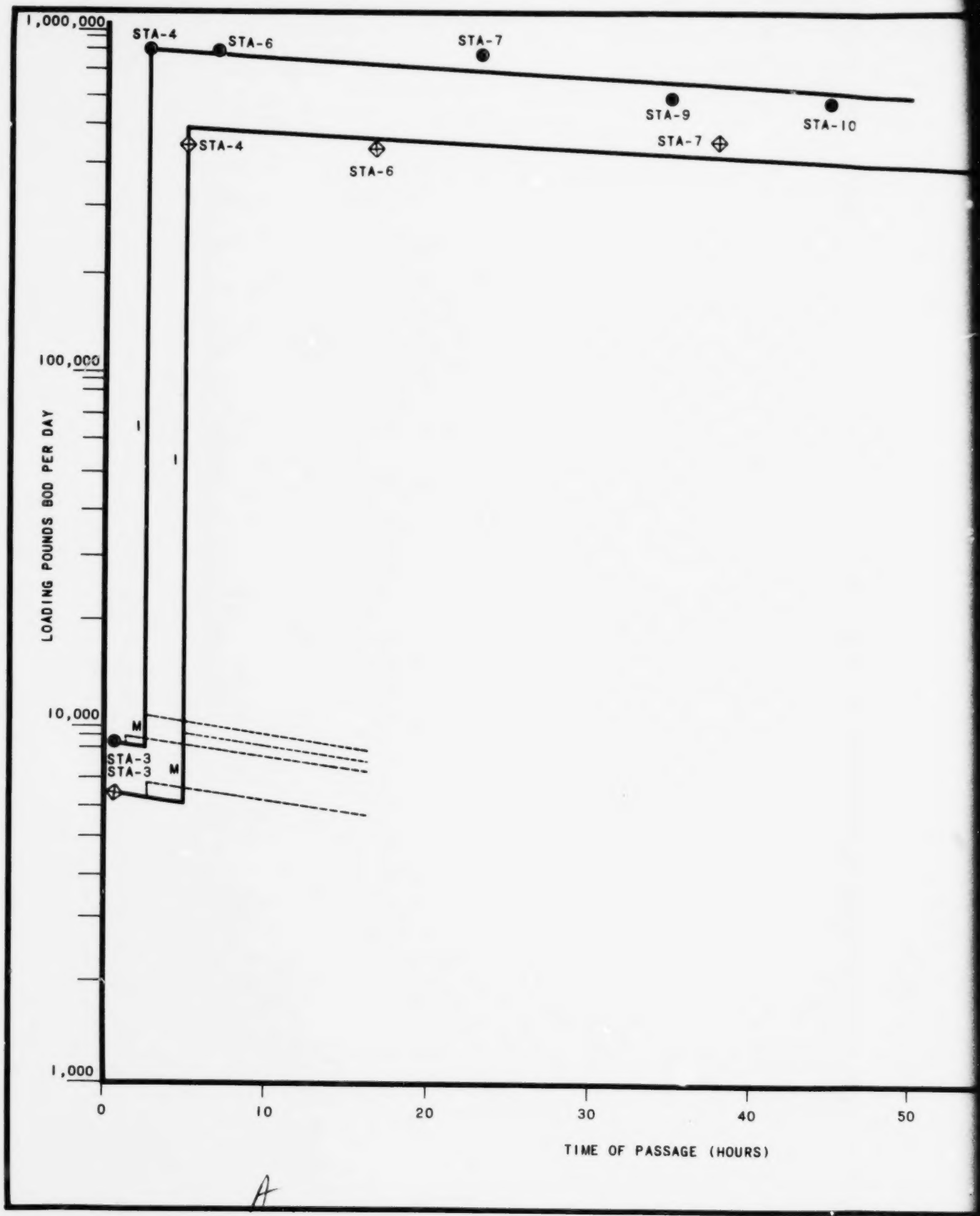
of 5,900 people are treated by another lagoon which also provides 85 percent reduction of BOD. This lagoon is designed to handle a total of 24,000 population equivalents. Wastes of about 1,300 P.E. discharge without treatment to Tallahala Creek directly above the Masonite Plant outfalls. Wastes from the remaining 12,000 people are treated by a lagoon which provides 85 percent reduction of BOD.

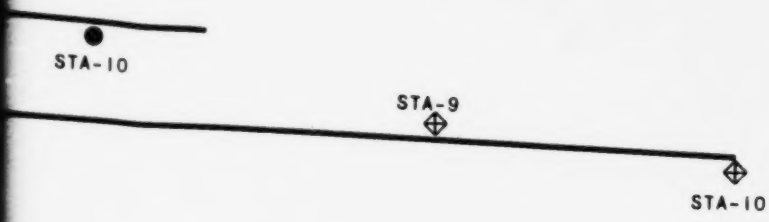
Industrial wastes with two exceptions are discharged into municipal sewers. The Masonite Corporation plant is the largest producer of wastes in the watershed. Information on the quantity or quality of these wastes is not directly available. However, in the stream survey, it was found that during the summer period up to 25,000 lbs. of 5-day BOD/day and during the winter up to 2,000,000 lbs. of 5-day BOD/day were released from this plant (Figures 5a, 5b, and 5c). Wastes are discharged through a system of six lagoons which impound the wastes in times of low flow for discharge in times of high flow. The high flow release pattern used by the plant is based on the availability of dilution water in the Leaf River. No attempt is made to protect the quality of Tallahala Creek during the winter period. While no wastes are intentionally released from the lagoons during low flow periods, it was found during the summer survey that the combined effect of leakage, entrained wastes in cooling water, a separate constant discharge of process water, and other sources of municipal and industrial wastes amounted to approximately 25,000 lbs. of 5-day BOD/day. Figures 6a, 6b, and 6c show the dissolved oxygen profiles measured during the surveys.

TABLE 3
BASIC DATA ON MUNICIPAL AND INDUSTRIAL WASTE DISCHARGES
TALLAHALA CREEK SUB-BASIN
MISSISSIPPI

Municipality or Industry	1960 Population or Employment	Estimated Population Served	Estimated Average Flow mgd	Type Treatment	Design Capacity PE 1000	Design Capacity Flow mgd	Estimated PE Untreated	Estimated PE Discharged	Receiving Stream
Ellisville	4,590	1,500	x	None	--	--	1,500	1,500	Tallahala Cr.
		1,050	x	None	--	--	1,050	1,050	Rocky Creek
		1,000	x	Lagoon	(3 acres)	--	1,000	150	Rocky Creek
Packing House	x	--	x	None	--	--	200	200	Rocky Creek
Laurel	27,890	1,000	x	Lagoon	(5 acres)	--	1,000	150	Tallahala Cr.
		12,000	x	Lagoon	(95 acres)	--	17,900/1	2,680	Tallahala Cr.
		800 (est.)	x	None	--	--	1,280/2	1,280	Tallahala Cr.
		12,000	x	None/3	/3	--	12,000	12,000	Tallahala Cr.
		2,000	x	Lagoon	(12 acres)	--	2,000	300	Tallahoma Cr.
Dairy	16	--	x	Lagoon	(1 acre)	--	1,750	875	Tallahoma Cr.
Wood Products Plant	3,400	x	x	Clarifiers 6 Lagoons	x	x	x	/4	Tallahala Cr.
Rendering Plant	x	x	x	x	x	x	x	x	Tallahala Cr.

/1 Includes industrial waste from packing house and poultry processing plants.
/2 Includes industrial waste.
/3 85 acre lagoon under construction to handle these wastes.
/4 Calculated from stream data to range from 120,000 to 12,000,000 PE per day.
x Data not available


1,000,000
100,000
10,000
1,000
LOADING POUNDS BOD PER DAY
STA-4
STA-6
STA-7
STA-9
STA-10
STA-4
STA-6
STA-7
I
I
M
STA-3
STA-3
M
0
10
20
30
40
50
TIME OF PASSAGE (HOURS)



Calculated Loads Between Stations 3 and 4

◉ - Mar. 1-Mar 5, 1965
Municipal - 2,175 lbs/day
Industrial - 870,000 lbs/day

⊕ - Mar 8-Mar 12, 1965
Municipal - 2,175 lbs./day
Industrial- 410,000 lbs./day

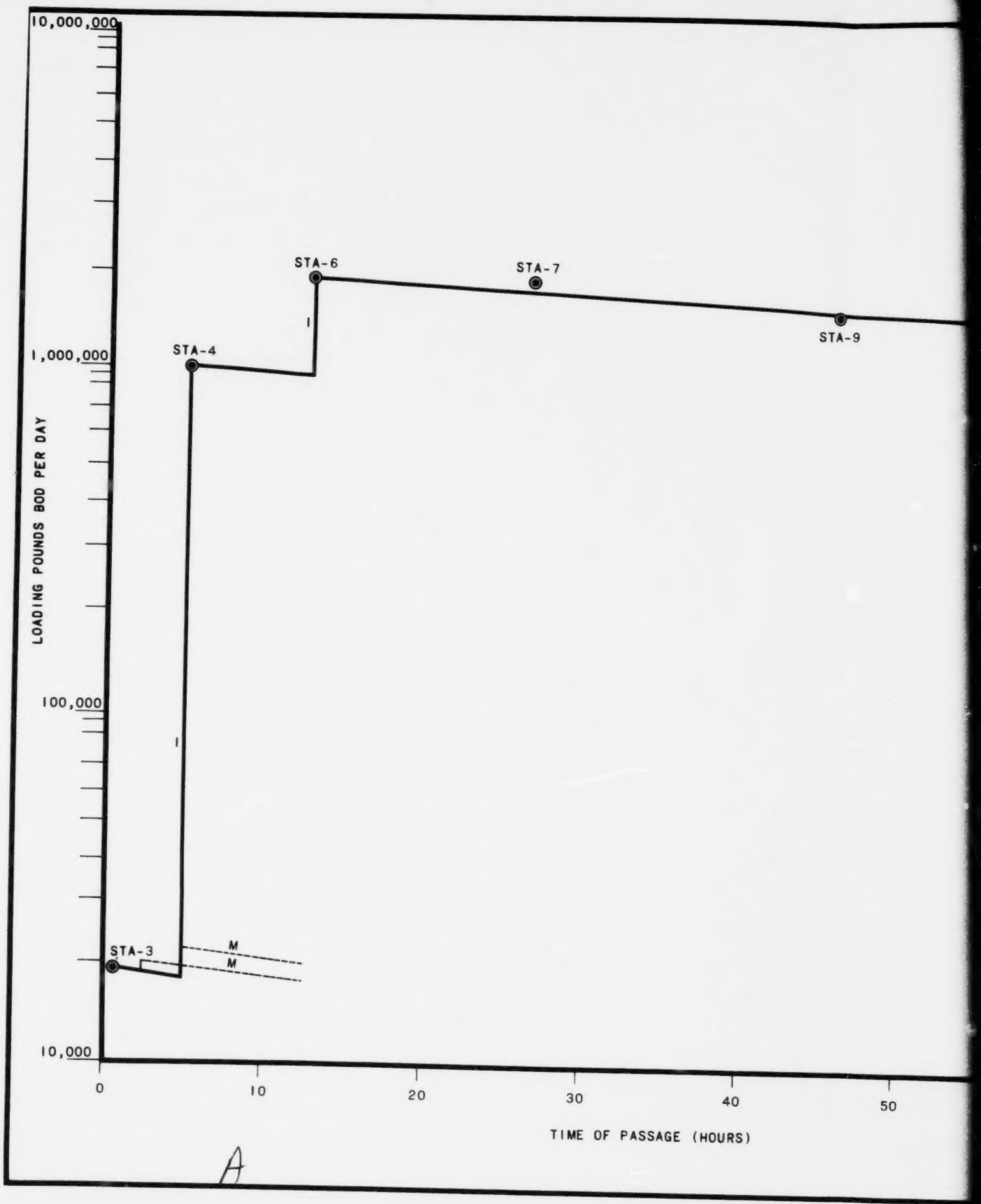
FIGURE 5A
DEC. 1965

B

SOUTHEASTERN COMPREHENSIVE WATER POLLUTION CONTROL PROJECT

TALLAHALA CREEK BOD LOADING CURVES

U.S. DEPARTMENT OF HEALTH, EDUCATION, & WELFARE
PUBLIC HEALTH SERVICE
DIVISION OF WATER SUPPLY & POLLUTION CONTROL
REGION IV ATLANTA, GEORGIA


10,000,000
1,000,000
100,000
10,000
LOADING POUNDS BOD PER DAY
STA-3
STA-4
STA-6
STA-7
STA-9
M
M
I
I
0
10
20
30
40
50
TIME OF PASSAGE (HOURS)
A

Calculated loads between Stations 3 and 6

Municipal	- 2,175 lbs. per day
(3-4)	- 998,000
(4-6)	- 940,000
Industrial	-1,938,000 lbs. per day

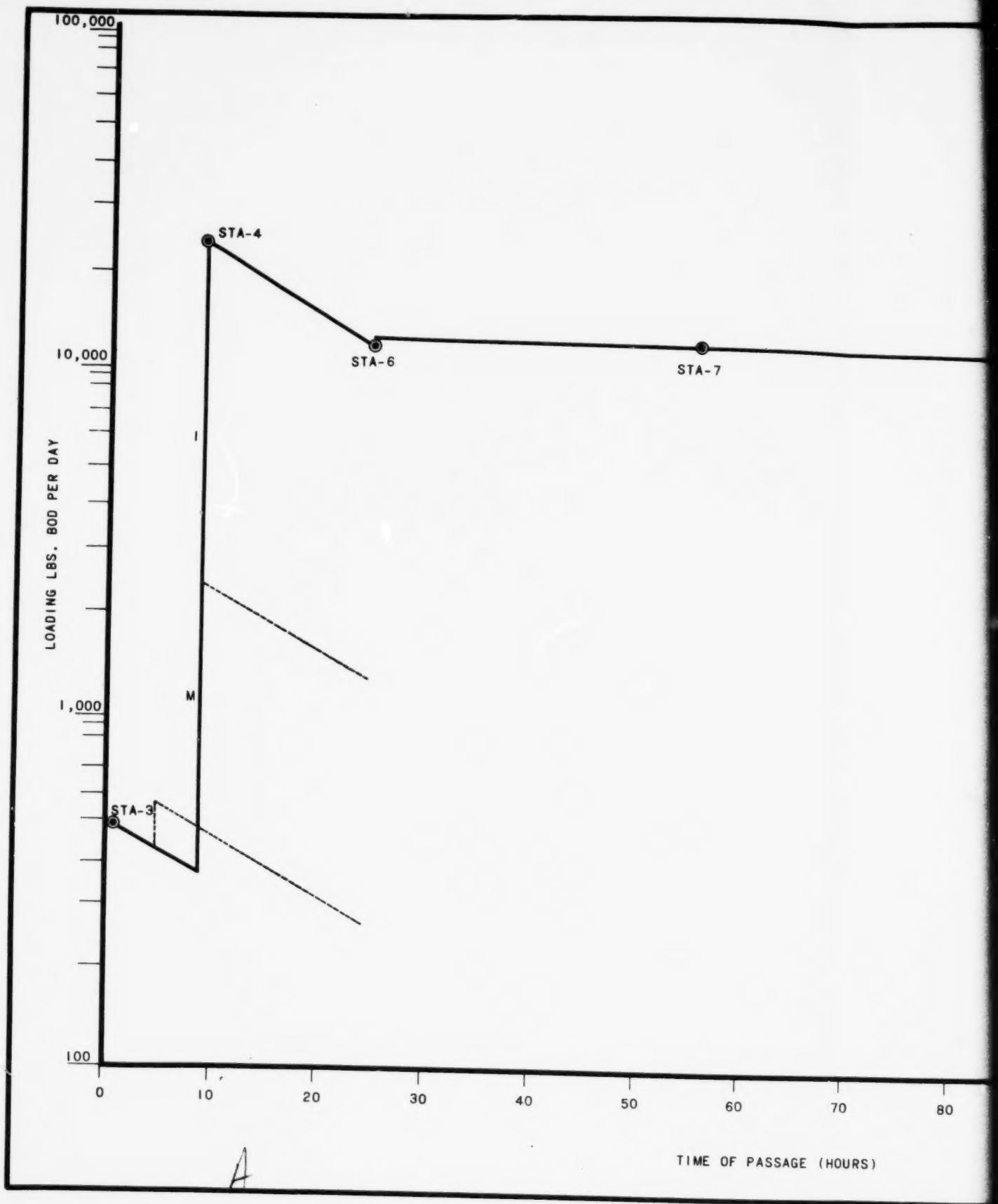
FIGURE 58
DEC. 1965

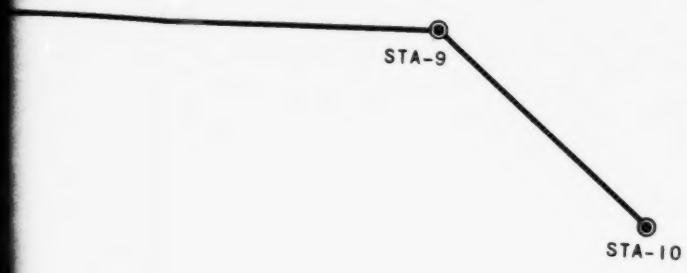
B

SOUTHEASTERN COMPREHENSIVE WATER POLLUTION CONTROL PROJECT

TALLAHALA CREEK BOD LOADING CURVE
March 15-26 1965

U.S. DEPARTMENT OF HEALTH, EDUCATION, & WELFARE
PUBLIC HEALTH SERVICE
DIVISION OF WATER SUPPLY & POLLUTION CONTROL
REGION IV ATLANTA, GEORGIA

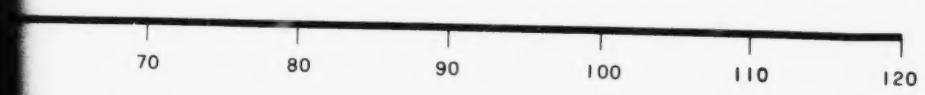

100,000
10,000
1,000
100
LOADING LBS. BOD PER DAY
STA-4
STA-6
STA-7
STA-3
I
M
0
10
20
30
40
50
60
70
80
TIME OF PASSAGE (HOURS)



Calculated loads between Stations 3 and 4

Municipal - 2,175 lbs. per day
Industrial-22,500 lbs. per day

FIGURE 5c
DEC. 1965



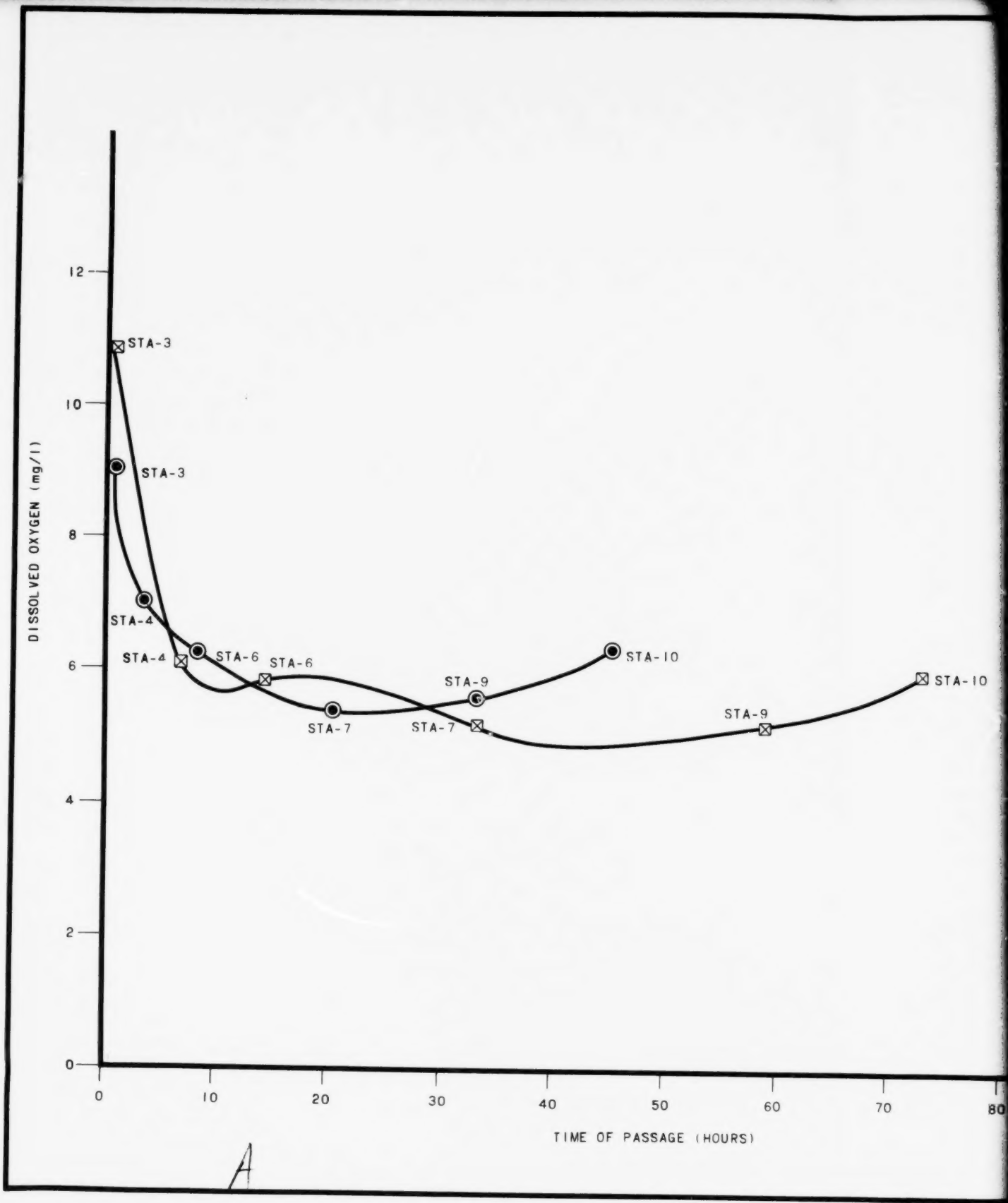
B

ASSAGE (HOURS)

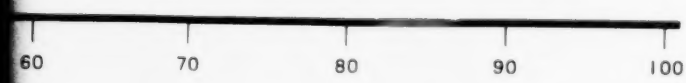
SOUTHEASTERN COMPREHENSIVE WATER POLLUTION CONTROL PROJECT

TALLAHALA CREEK BOD LOADING CURVE
June 3-Aug 6 1965

U.S. DEPARTMENT OF HEALTH, EDUCATION, & WELFARE
PUBLIC HEALTH SERVICE
DIVISION OF WATER SUPPLY & POLLUTION CONTROL
REGION IV ATLANTA, GEORGIA


DISSOLVED OXYGEN (mg/l)
12
10
8
6
4
2
0
STA-3
STA-3
STA-4
STA-4
STA-6
STA-6
STA-7
STA-7
STA-9
STA-9
STA-10
STA-10
0
10
20
30
40
50
60
70
80
TIME OF PASSAGE (HOURS)

A



B

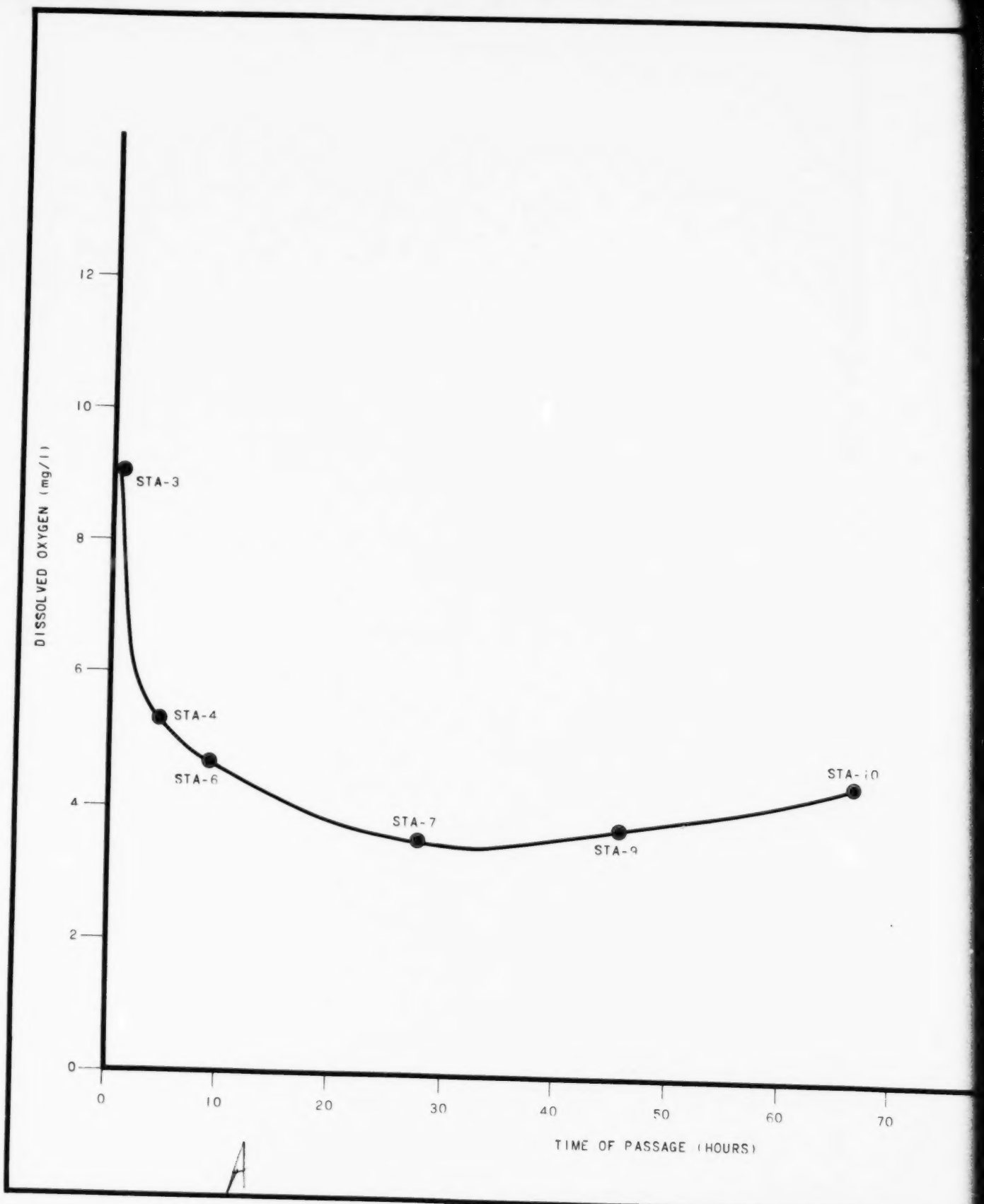
● --March 1-5, 1965
⊠ --March 8-12, 1965

FIGURE 6A
DEC. 1965

SOUTHEASTERN COMPREHENSIVE WATER POLLUTION CONTROL PROJECT

TALLAHALA CREEK
DISSOLVED OXYGEN PROFILES

U.S. DEPARTMENT OF HEALTH, EDUCATION, & WELFARE
PUBLIC HEALTH SERVICE
DIVISION OF WATER SUPPLY & POLLUTION CONTROL
REGION IV ATLANTA, GEORGIA


DISSOLVED OXYGEN (mg/l)
12
10
8
6
4
2
0
STA-3
STA-4
STA-6
STA-7
STA-9
STA-10
0
10
20
30
40
50
60
70
TIME OF PASSAGE (HOURS)

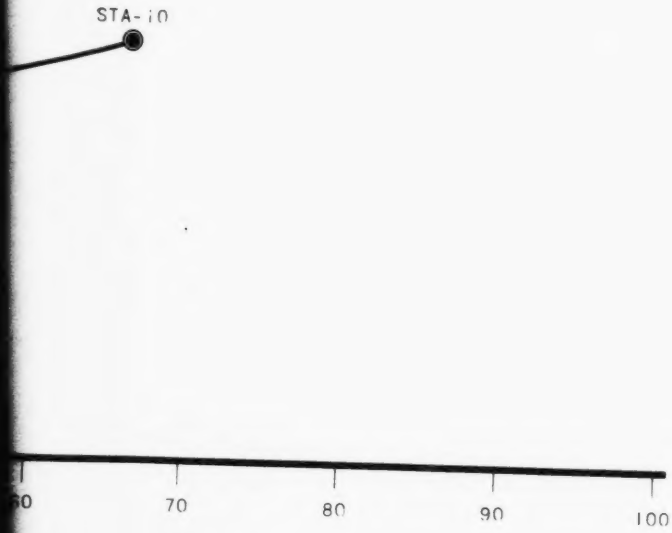


FIGURE 6B
DEC. 1965

SOUTHEASTERN COMPREHENSIVE
WATER POLLUTION CONTROL
PROJECT

TALLAHALA CREEK
DISSOLVED OXYGEN PROFILE
March 15-26 1965

U.S. DEPARTMENT OF HEALTH, EDUCATION, & WELFARE
PUBLIC HEALTH SERVICE
DIVISION OF WATER SUPPLY & POLLUTION CONTROL
REGION IV
ATLANTA, GEORGIA

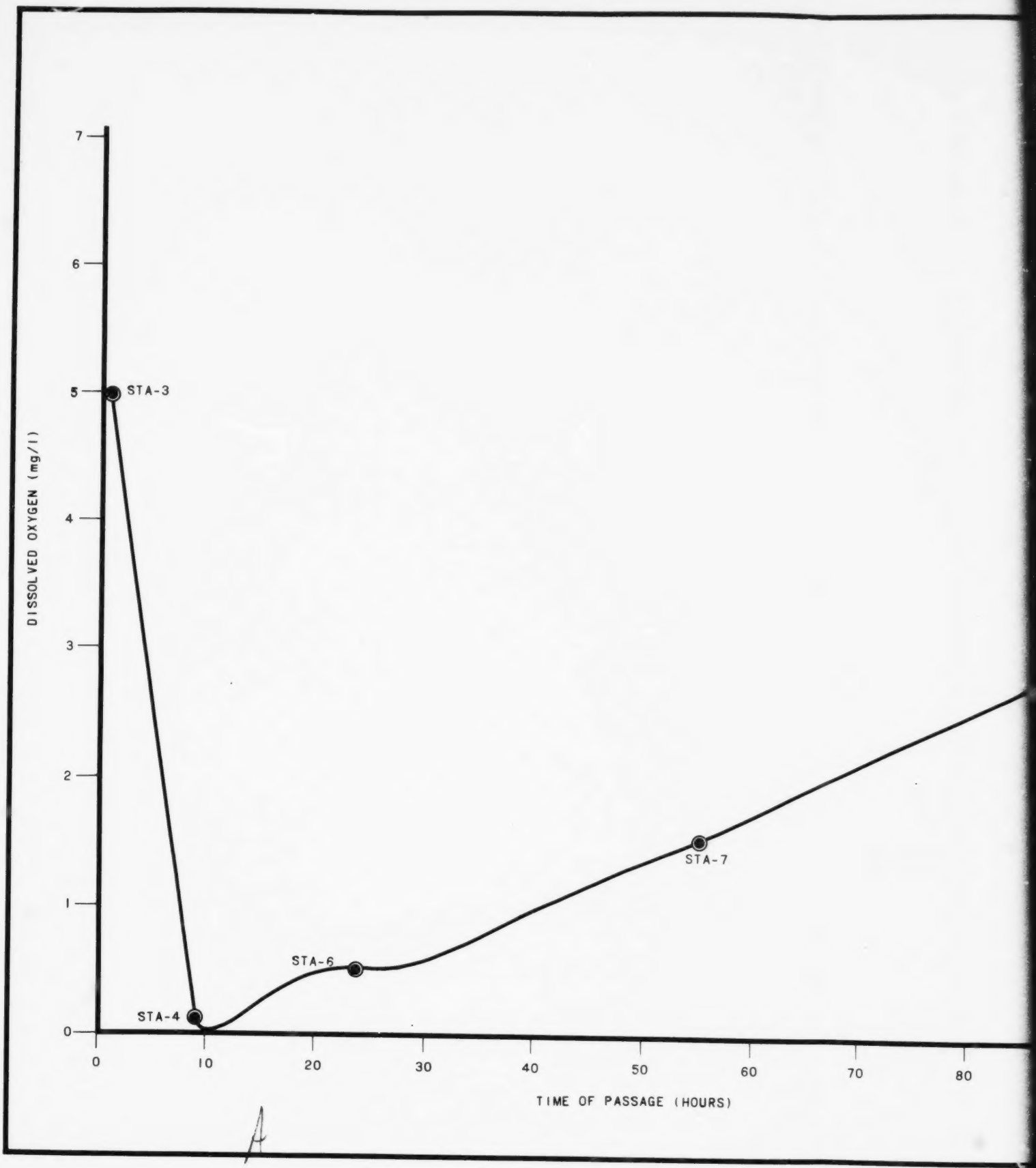

DISSOLVED OXYGEN (mg/l)
7
6
5
4
3
2
1
0
STA-3
STA-4
STA-6
STA-7
0
10
20
30
40
50
60
70
80
TIME OF PASSAGE (HOURS)

FIGURE 6c
DEC. 1965

B

SOUTHEASTERN COMPREHENSIVE WATER POLLUTION CONTROL PROJECT

TALLAHALA CREEK
DISSOLVED OXYGEN PROFILE
June 3-August 6, 1965

U.S. DEPARTMENT OF HEALTH, EDUCATION, & WELFARE
PUBLIC HEALTH SERVICE
DIVISION OF WATER SUPPLY & POLLUTION CONTROL
REGION IV ATLANTA, GEORGIA

In addition to this plant, a rendering plant also discharges wastes to Tallahala Creek. Table 3 gives a complete inventory of municipal and industrial waste discharges in the study area.

WATER QUALITY CRITERIA

Surface waters in the Tallahala Creek watershed are limited to in-place uses of fishing and waste disposal. Tallahala Creek below Laurel is used exclusively for waste disposal; whereas upstream from Laurel both Tallahala Creek and its main tributary, Tallahoma Creek, are used for sport fishing. Sunfish and bass are the major species in these waters. The Leaf River above Hattiesburg is also used for sport fishing. In the reach immediately below Hattiesburg, the stream is used just for waste disposal; however, below Beaumont, there are both sport and commercial fishing.

The major pollution problem in Tallahala Creek results from discharge of organic degradable wastes which reduce oxygen levels to zero at times. During the summer survey, anaerobic conditions were noted in Tallahala Creek. This oxygen depletion has precluded the use of this stream for most all other uses. Fishing, which is a major use of surrounding streams, is not possible in Tallahala Creek with present oxygen levels. Other downstream uses, such as water supply for municipal and industrial purposes, are not possible with the present organic pollution in the creek. To allow for the full development, both present and furture, of Tallahala Creek for such uses, a minimum dissolved oxygen level of 4.0 mg/l has been recommended.

This quality goal has been endorsed by both the Mississippi State Board of Health and the Mississippi Game and Fish Commission, the State agencies responsible for water pollution control. Attainment of this quality goal will allow Tallahala Creek to be used for purposes other than waste disposal. Maintenance of this goal will require: (1) The provision of 85 percent BOD removal from all municipal and connected industrial wastes (a degree of treatment normally obtained in this area); (2) The release of adequately treated wastes to contain not more than 8,400 lbs. of 5-day 20° BOD/day (decrease to 6,700 lbs. in 2015) from the Masonite Corporation plant during periods of flow augmentation; and (3) storage in the proposed Tallahala Creek Reservoir for streamflow regulation. Inasmuch as information on waste loads from the Masonite plant was not available, a percent reduction of load cannot be given. However, based on the estimate of a doubling in industrial development, and municipal population it is expected that the residual pollution remaining after segregation of highly concentrated industrial wastes and such treatment as is currently provided could result in a loading of 50,000 lbs of 5-day 20° BOD/day. Therefore, the provision of 85 percent BOD reduction of municipal wastes and a thorough industrial waste cleanup including removal of settleable solids, aeration of waste discharges and limiting the Masonite plant discharge to 8,400 to 6,700 lbs of 20° 5-day BOD per day will provide a significant reduction in the residual pollution load.

Other types of wastes, e.g., stormwater runoff, are considered uncollectable and, therefore, not subject to treatment. Since the City of Laurel has a minimum of combined storm and sanitary sewers, the wastes from this source are not considered significant.

WATER QUALITY SURVEY

In February-March and June-August 1965, a stream survey of the study area was conducted as part of the study of the Southeastern Comprehensive Water Pollution Control Project and was made under the inter-agency coordinated study of the Pascagoula River Basin. The purpose of the stream survey was to obtain the required data for the determination of waste assimilative capacity of Tallahala Creek as well as water quality to evaluate water supply and water quality control requirements. A detailed description of the survey and its results is contained in Appendix 2.

FLOW REGULATION

The stream su vey showed that oxygen depression in Tallahala Creek occurred during the critical summer period from immediately below the Laurel and Masonite plant outfalls to essentially the mouth of Tallahala Creek, a distance of some 54 miles which is over half the entire length of the stream. Flow augmentation is required to keep the entire stream at an oxygen level of at least 4.0 mg/l at all times.

Streamflow requirements are expected to remain constant during the 50-year study period. Since the major contributor of wastes in the area, the Masonite plant, has the ability to hold its wastes, flow requirements have been based on limiting the discharges from the Laurel area to a minimum throughout the 50-year study period.

This amount is 10,000 lbs. of BOD per day which includes all the present and future municipal and industrial waste discharge in the Laurel-Jones County area after treatment. Existing and future allowable loads are presented in Table 4.

TABLE 4
EXISTING AND ALLOWABLE WASTE LOADS
LAUREL-JONES COUNTY
1,000 lbs. 5-day BOD/day

Year	Municipal		Industrial				Total	
			Food & Other		Particle Board			
	Untreated	Discharged	Untreated	Discharged	Untreated	Discharged	Untreated	Discharged
1965[1/]	5.3	3.0	1.4	.5	*	*	-	-
1965[2/]	5.3	1.4	1.4	.2	-	8.4	-	10.0
1980	11.3	1.7	1.9	.3	-	8.0	-	10.0
2015	18.4	2.8	3.3	.5	-	6.7	-	10.0

* Quantity of present untreated and discharged wastes from Masonite Corporation plant unknown. The 1965 stream survey showed discharge wastes from plant to range from 25,000 to 2,000,000 lbs/day over a week period.

1/ Existing loads.

2/ Allowable loads with flow augmentation from Federal reservoir

Based on the above loadings, the annual draft or storage required for streamflow regulation is estimated to be 13,650 acre-feet. Natural flows would be adequate for maintenance of water quality only during the cold weather months (December-April); therefore, augmentation is required during the remaining months of May through November. Water releases are required to maintain the following 24-hour minimum flows at Laurel above the waste discharges.

TABLE 5
MINIMUM STREAMFLOW REQUIREMENTS AT LAUREL
24-hour (cfs)

Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.
20	10	10	10	25	30	35	50	50	50	50	35

Table 5 and Figure 7 represent the requirements at Laurel. In order to determine the required rate of releases from the dam, it will be necessary to maintain a water quality monitoring system in the critical stream stretch (just below Tallahoma Creek). Such a system could be a cooperative effort of appropriate State and local agencies.

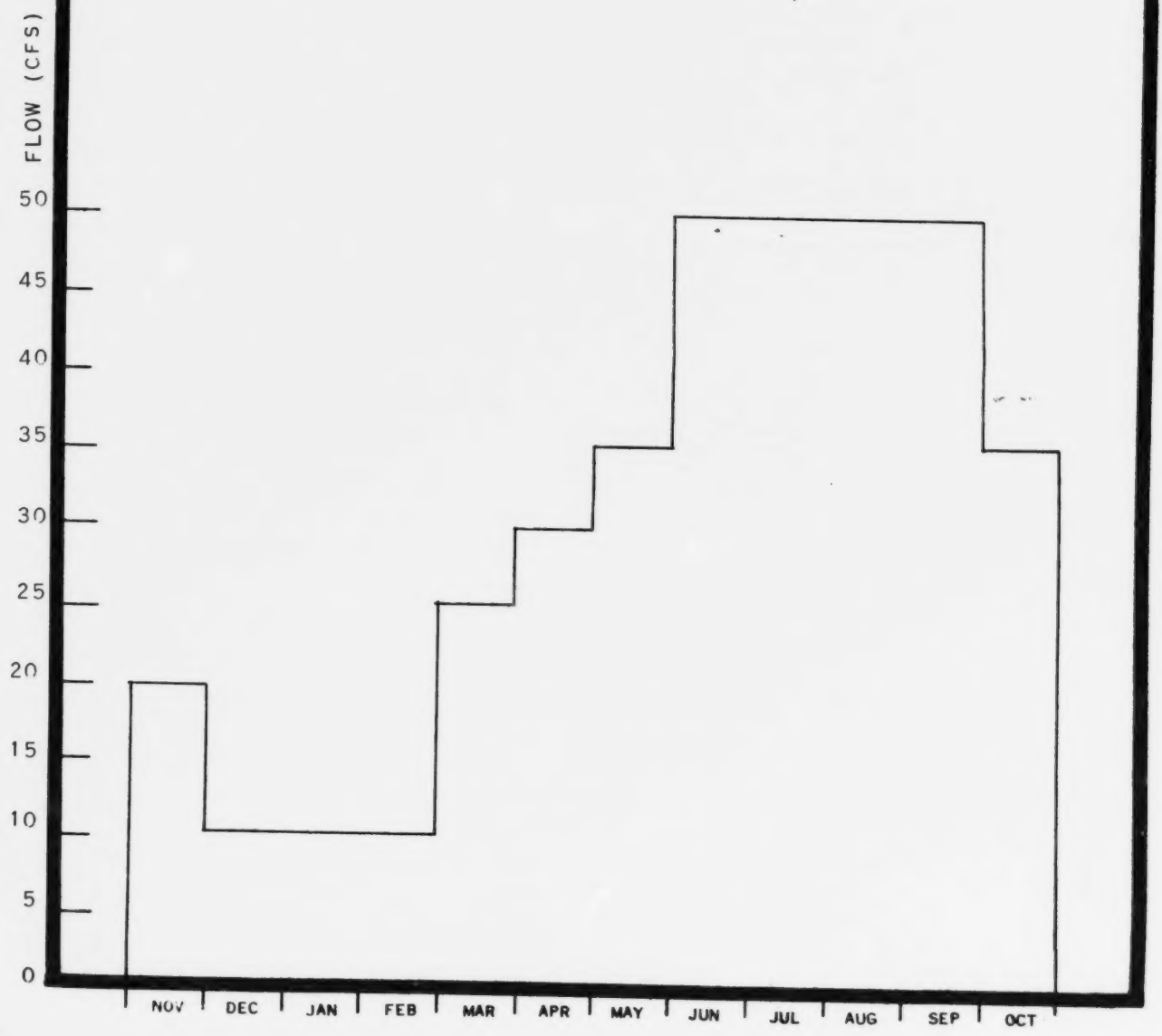
Continuous releases from the dam to maintain the above flows should contain sufficient dissolved oxygen for maintenance of a well rounded fish population, i.e., 4.0 mg/l. Since the water in the reservoir is not expected to stratify, intake structures located above the sediment pool will assure adequate oxygen in the released waters.

SOUTHEASTERN COMPREHENSIVE WATER POLLUTION CONTROL PROJECT

TALLAHALA CREEK
FLOW REQUIREMENTS AT LAUREL

U. S. DEPARTMENT OF
HEALTH, EDUCATION & WELFARE
PUBLIC HEALTH SERVICE
REGION IV ATLANTA, GEORGIA

FIGURE 7
DEC. 1965



BENEFITS

MUNICIPAL AND INDUSTRIAL WATER SUPPLY STORAGE

The economic development of an area depends in no small way upon the water resource it has available. This resource must be able to support the demands of the area both in quantity and quality. The estimates of economic and demographic growth made in this study were based on the availability of such a resource. Municipal and industrial water supply benefits result from improvements in quantity, dependability, quality, and physical convenience of water use. The amount water users would be willing to pay for such improvements in lieu of foregoing them affords an appropriate measure of this value. In this study, however, as in general practice, the evaluation of this benefit was approximated by the cost of achieving the same results by the most likely alternative means that would be utilized in the absence of the multi-purpose project.

Annual benefits are based on the annual equivalent differential capital cost of the least costly alternative and discounted back to present worth, plus annual differential cost of operation and maintenance (including replacement and maintenance of equipment). The three alternative water sources considered for this evaluation are:

1. Single purpose reservoir on Tallahala Creek
2. Single purpose reservoir on Tallahoma Creek
3. Ground water

Tallahala Creek

Impoundment for water supply on Tallahala Creek was considered at the same site as the proposed multi-purpose project. Information received from the Mobile District, U. S. Army Corps of Engineers, showed that 34,000 acre-feet of storage would be needed to provide for the projected demand of 45 mgd by the year 2015. Cost per acre-foot of storage was obtained from data supplied by the Mobile District and from Table 40 of the Senate Select Committee Print No. 32, Water Resources Activities in the United States, Water Supply and Demand. Total storage cost at the Tallahala Creek site was estimated at $8,200,000.

It was assumed that water would be released from the single-purpose reservoir as well as from the multi-purpose reservoir for pumping from the stream at a point four miles from the site of the water treatment plant; therefore, there were no differential treatment costs.

Tallahoma Creek

The same procedures were used in evaluating the cost of storage as for Tallahala Creek. Total storage cost was estimated at $8,900,000. Since it would require an additional mile of transmission line to obtain water from Tallahoma as the multi-purpose project, the cost of this line ($338,000) was added to the storage cost.

Ground Water

Because of the rapidly declining water levels presently being experienced with the existing ground water supply, a completely new system of well fields was considered. Information received

from the U. S. Geological Survey stated that a 45 mgd demand could be developed within 10 miles of the Laurel area.

The development of two well fields, one within five miles and the other within ten miles of Laurel, was considered. Each field was divided into two sections each containing eight wells spaced on 1000-foot centers with capacities of 1000 gpm each (a total of 32 wells). Cost estimates were based on installing the first field in 1965 and the second in 1980.

The first cost of developing the ground water source was estimated at $560,000 for each of the two well fields. Differential piping and transmission costs (including land and pumps) were estimated at $1,848,000, and differential treatment costs were estimated at a $-4,720,000 (capital cost of the surface water treatment plant was higher than the capital cost of the ground water treatment plant). The differential operation and maintenance costs were estimated at $402,000 by the year 2015 which reflects the higher pumping and power costs associated with ground water supplies. Since ground water was the least costly alternative, the cost of the four-mile transmission line ($1,350,000) to the multi-purpose project was deducted from the cost of obtaining ground water.

Discounting the capital costs to obtain annual equivalent costs and adding these to the differential operation and maintenance cost gave a present annual value of approximately $164,000 which was the least costly alternative and, therefore, taken as the present annual value of the minimum benefits for storage in the proposed multi-purpose project.

WATER QUALITY CONTROL

As in the case of the provision of an adequate and dependable water supply, maintenance of downstream quality at levels satisfactory for multi-use is required for the full economic development of the Tallahala Creek sub-basin. Continued maintenance of quality to levels satisfactory only for the transport of municipal and industrial wastes could limit the estimated economic and demographic development projected for the downstream areas. Water quality control benefits are the net contribution to public health, safety, economy, and effectiveness in use and enjoyment of water for all purposes which are subject to detriment or betterment by virtue of change in water quality.

Projected residual pollution loads from the Laurel-Jones County study area (after provision of adequate treatment) are of the same magnitude as those loads observed during the summer survey. Therefore, downstream conditions also can be expected to be similar if further controls are not put on quality management.

Fishing is common in Tallahala Creek above Laurel and in Tallahoma Creek. As has been stated, a wide variety of species of fish varying from bass to catfish have been caught in these unpolluted streams. The Leaf River is not only used for sport fishing but also for commercial fishing in reaches below Beaumont.

Tallahala Creek below Laurel is completely devoid of fish and, most likely, of nearly all types of fish food organisms. Residents of the area have been aware of the gross pollution which has existed in this stream for a number of years.

While no one had reported fish kills in the creek during the survey, kills have been reported in the past and it is generally felt that fish once living in Tallahala Creek had migrated to other tributary streams of the Pascagoula. The U. S. Fish and Wildlife Service has reported that Tallahala Creek has a potential of providing 3,500 man-days of fishing per year if adequate water quality were maintained.

In addition to actual loss of use, the stream is esthetically a nuisance. Visible signs of municipal and industrial pollution such as color and solids make the stream unacceptable for prospective residents and industries. In its present condition, the stream could be considered a liability. Improvement in quality would be a definite asset that would increase the value of property adjacent to the stream banks.

Public health and welfare liabilities resulting from the condition of Tallahala Creek below Laurel are not all readily evaluated but are definitely a potential. The Public Health Service recommends the coliform MPN not to exceed 5000 per 100 ml for Type III (waters requiring complete rapid sand filtration treatment, together with continuous postchlorination) domestic water supply sources. A maximum limit of 1000 MPN per 100 ml is generally accepted by various health agencies for water contact sports. In addition to the disease potential, polluted waters create an adverse psychological effect on people living and working in an undesirable environment.

During the study, several meetings attended by most of the water users of the sub-basin were held in the study area. Many of the groups present at the meetings expressed a definite desire to restore the water quality of Tallahala Creek to support fishing and other legitimate uses of this stream. Some, notably the Masonite Corporation, felt the stream should continue to be used for the disposal of wastes and that only the quality of the Leaf River should be protected. Various letters and statements made to the Public Health Service concerning downstream uses are contained in Appendix 5.

To meet the needs as described above, quality objectives have been recommended and related flow and waste loading requirements have been estimated. These quality objectives are designed to achieve the following:

1. Protection of public health and welfare;
2. Prevention of nuisance conditions;
3. Provision of an aquatic environment suitable for the propagation of fish and fish food organisms;
4. Enhancement of the aesthetic values of the stream and adjacent areas;
5. Assurance of continued economic development of downstream areas.

The controlling quality objective for Tallahala Creek is the provision of a healthy fish habitat Water quality criteria have been based on this objective. The primary beneficiaries of the recommended water quality control program are the resident population in the urban and rural areas adjacent to Tallahala Creek, especially in the Laurel-Jones County area. Some benefits (aesthetic) could be recognized as far downstream as the Leaf River

and possibly the Pascagoula River itself during periods of low flows. By virtue of the multiplicity of benefits (tangible and intangible) that are derived through maintenance of stream quality and the large number and varied nature and location of the people to whom these benefits accrue, the benefits attributable to measures specifically designed to achieve water quality control through flow regulation may be regarded as widespread and in harmony with both State and national goals for pollution control.

Since no adequate means have been devised to evaluate directly all of the economic effects of water quality control, the cost of achieving the same results by the most likely alternative in the absence of the project has been used as the minimum value of benefits. In this analysis, five alternatives were considered:

1. Single purpose reservoir on Tallahala Creek.
2. Single purpose reservoir on Tallahoma Creek with waste discharges piped to Tallahoma Creek.
3. Piping wastes to below confluence of Tallahala and Tallahoma Creeks with no storage for flow augmentation.
4. Piping wastes to below confluence of Tallahala and Tallahoma Creeks with storage for flow augmentation on Tallahala or Tallahoma.
5. Piping wastes to the Leaf River with no storage for flow augmentation.

A summary of this analysis is as follows:

Alternative No.	Differential Costs 1/	
	Capital Costs	O & M Costs
1	$5,600,000	$10,000
2	7,126,000	2/
3	Inadequate minimum flow.	
4	6,500,000	2/
5	8,000,000	2/

1/ Between alternative and multi-purpose project.

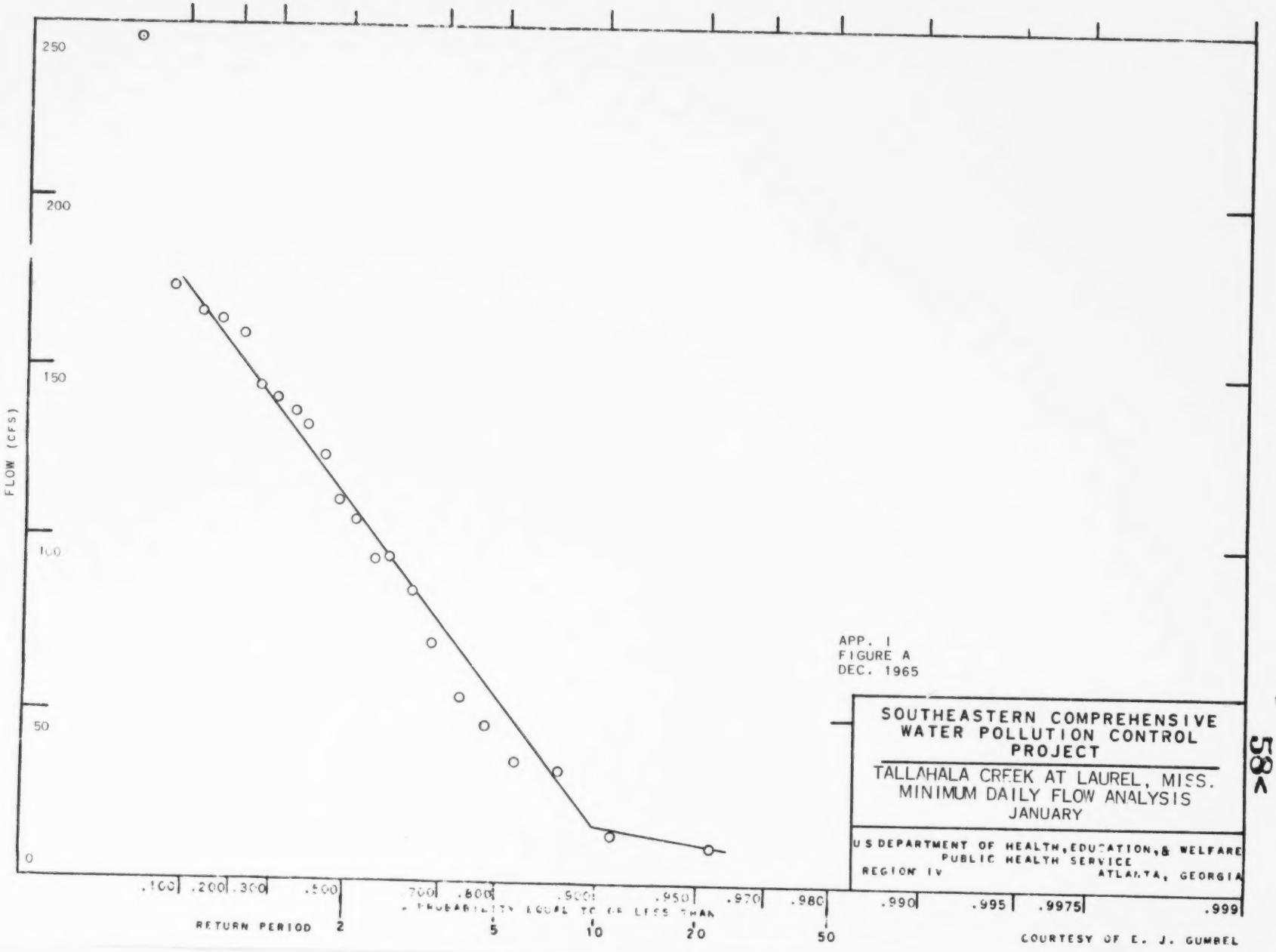
2/ O & M costs not calculated, per se, as they add to an already more costly alternative.

Annual benefits were based on the annual equivalent differential capital cost of the least costly alternative, plus any annual differential costs for operation and maintenance. Based on the least costly alternative (study purpose reservoir on Tallahala Creek) the present annual value of benefits for water quality control storage in the proposed multi-purpose project is approximately $233,000. Because there is an immediate need for streamflow regulation, this benefit required no discount.

APPENDIX 1

STATISTICAL ANALYSES OF ANNUAL AND MONTHLY LOW FLOW, TALLAHALA CREEK AT LAUREL

Number	Title
Figures A-L	Minimum Daily Flow Analyses, January - December
M	Minimum Daily Flow Analyses, Annual
N	Minimum 7-day Flow Analyses, Annual
Table A	Summary of Minimum Daily Flow Analyses by Months
B	Amount of Storage Required to Augment Natural Flows



APP. I
FIGURE A
DEC. 1965

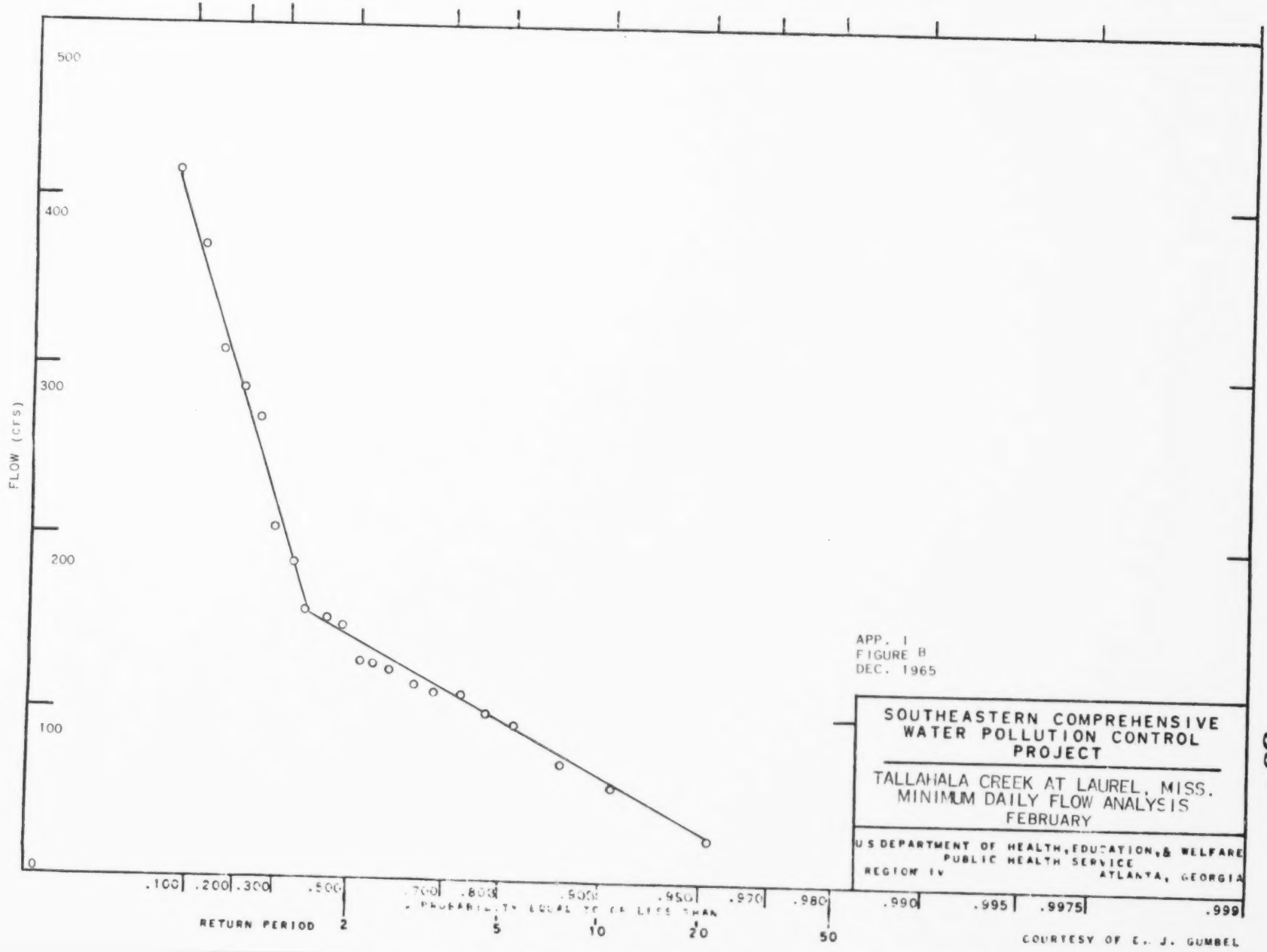
SOUTHEASTERN COMPREHENSIVE WATER POLLUTION CONTROL PROJECT

TALLAHALA CREEK AT LAUREL, MISS.
MINIMUM DAILY FLOW ANALYSIS
JANUARY

U S DEPARTMENT OF HEALTH, EDUCATION, & WELFARE
PUBLIC HEALTH SERVICE
REGION IV ATLANTA, GEORGIA

COURTESY OF E. J. GUMBEL

58A



APP. I
FIGURE B
DEC. 1965

SOUTHEASTERN COMPREHENSIVE WATER POLLUTION CONTROL PROJECT

TALLAHALA CREEK AT LAUREL, MISS.
MINIMUM DAILY FLOW ANALYSIS
FEBRUARY

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PUBLIC HEALTH SERVICE
REGION IV ATLANTA, GEORGIA

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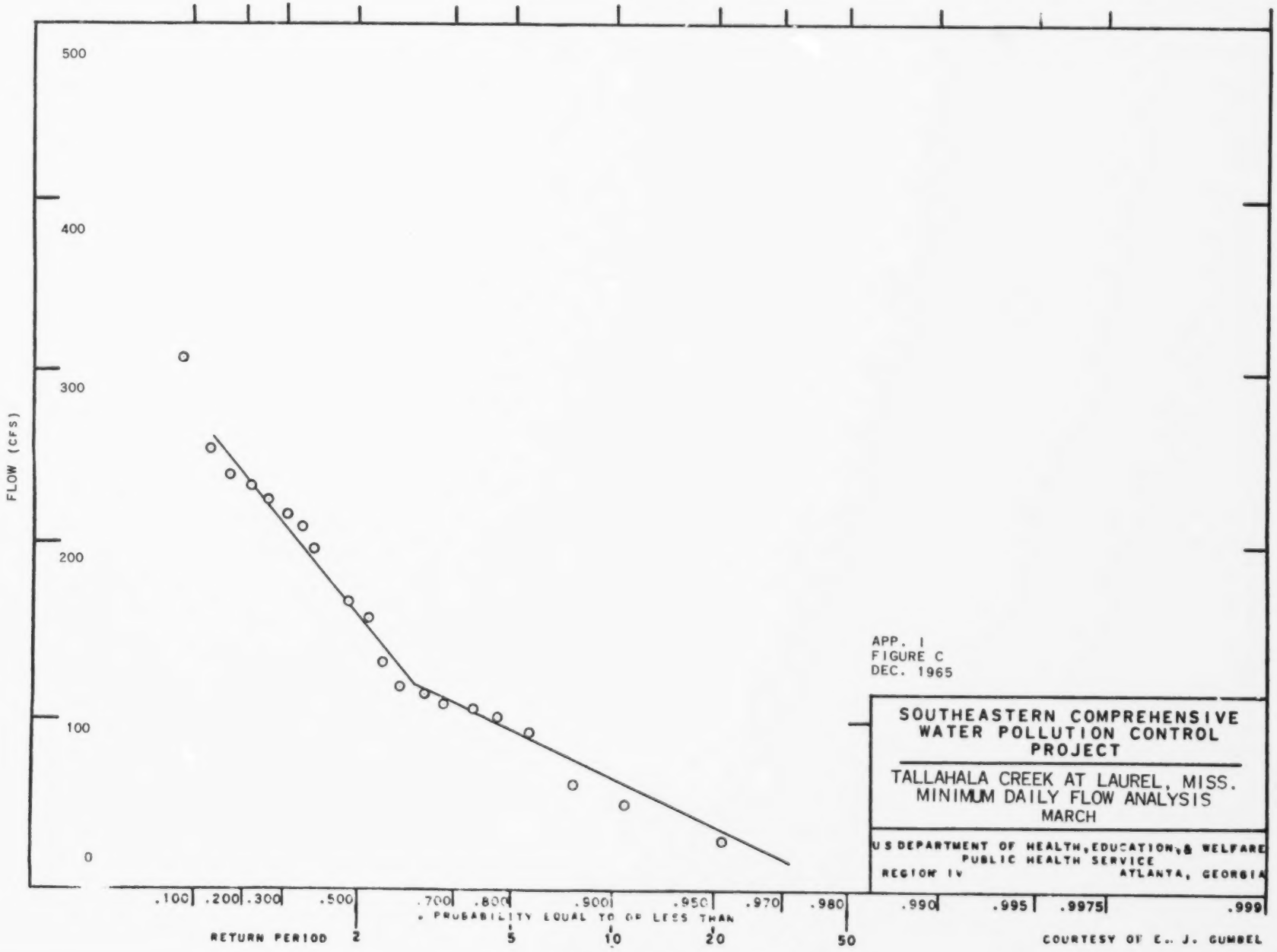
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.9975
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PROBABILITY EQUAL TO OR LESS THAN
RETURN PERIOD
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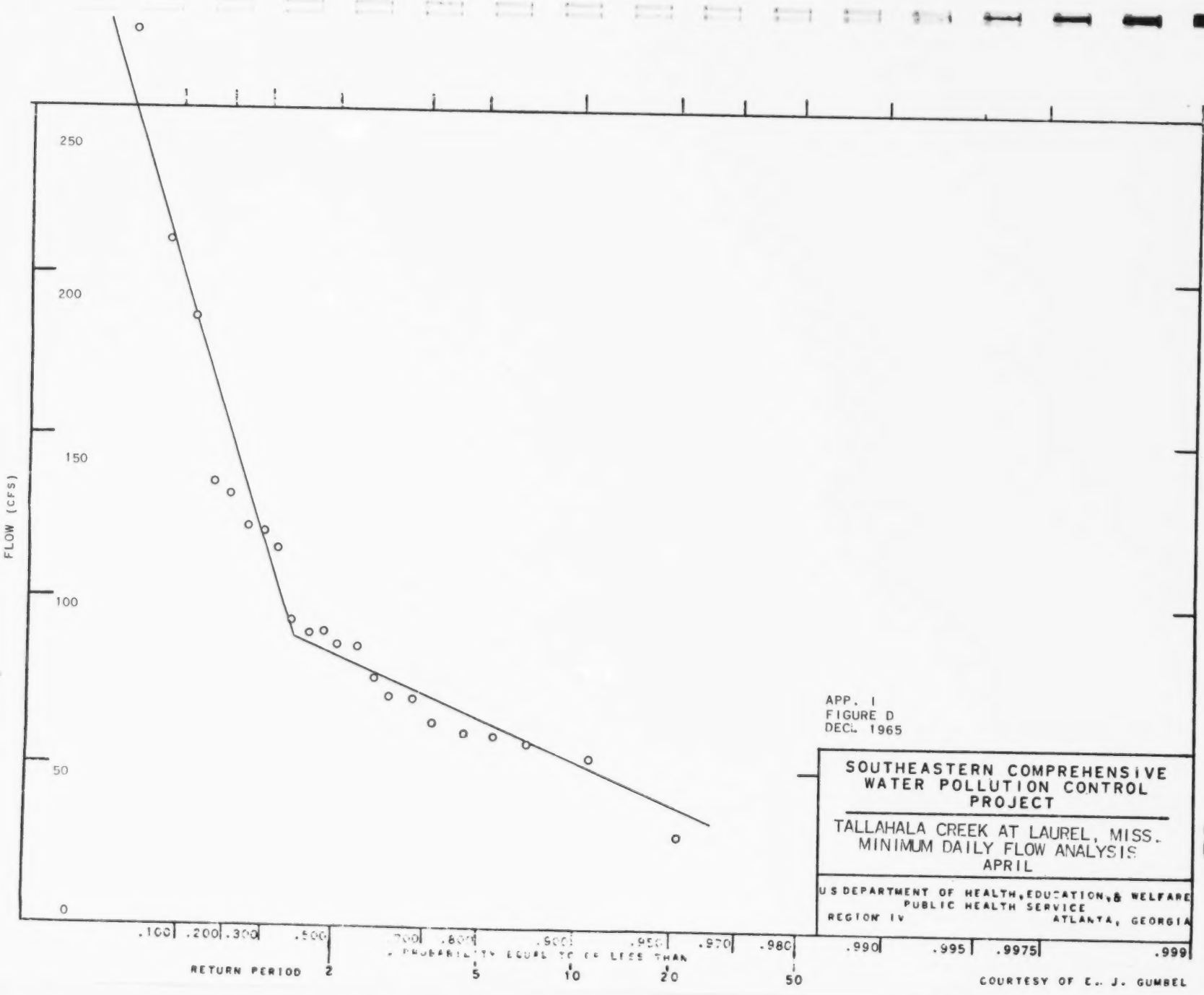
APP. I
FIGURE C
DEC. 1965
SOUTHEASTERN COMPREHENSIVE WATER POLLUTION CONTROL PROJECT
TALLAHALA CREEK AT LAUREL, MISS.
MINIMUM DAILY FLOW ANALYSIS
MARCH
U S DEPARTMENT OF HEALTH, EDUCATION, & WELFARE
PUBLIC HEALTH SERVICE
REGION IV
ATLANTA, GEORGIA
COURTESY OF E. J. GUMBEL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RETURN PERIOD
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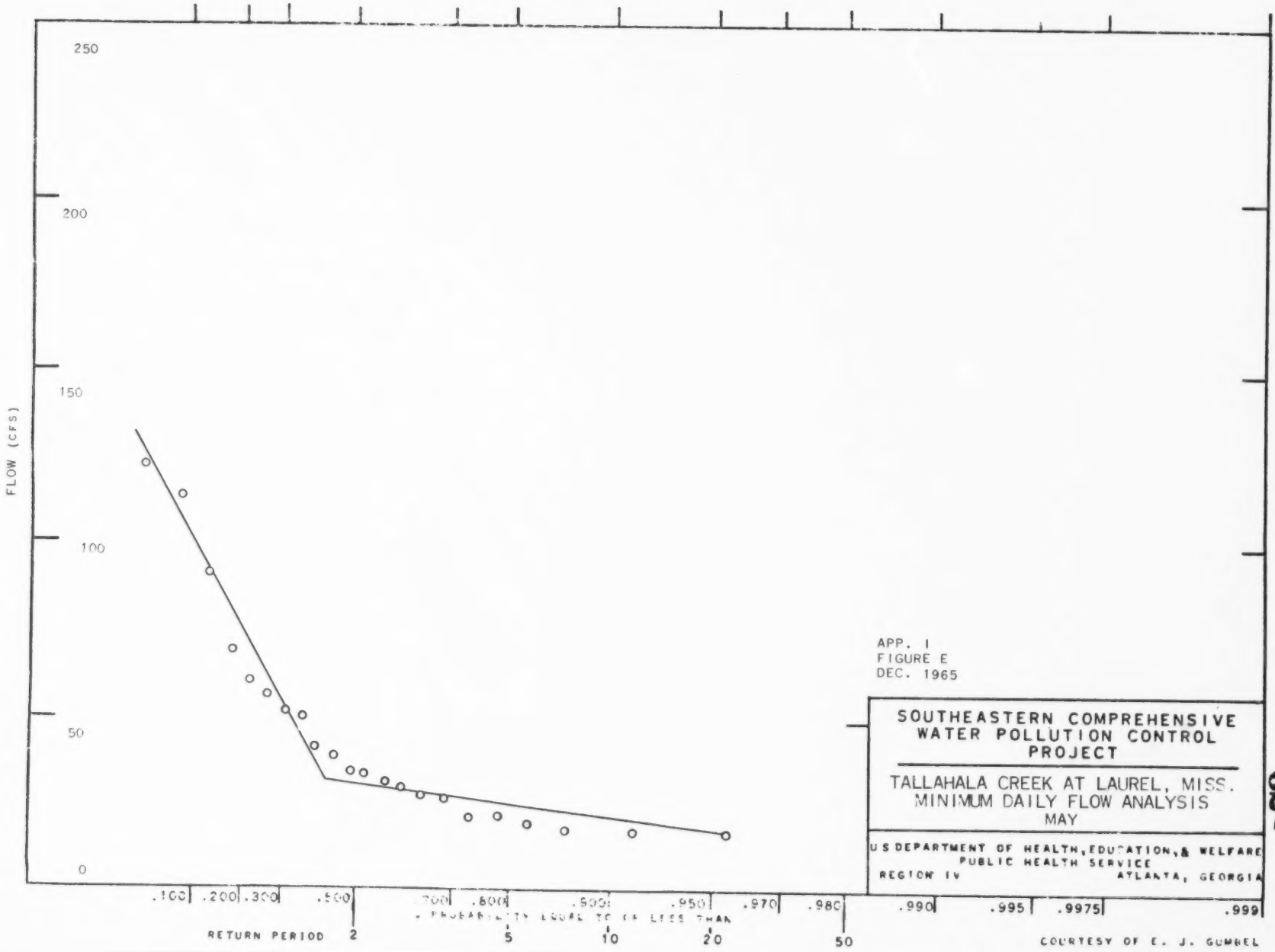
APP. I
FIGURE D
DEC. 1965
SOUTHEASTERN COMPREHENSIVE WATER POLLUTION CONTROL PROJECT
TALLAHALA CREEK AT LAUREL, MISS.
MINIMUM DAILY FLOW ANALYSIS
APRIL
U S DEPARTMENT OF HEALTH, EDUCATION, & WELFARE
PUBLIC HEALTH SERVICE
REGION IV
ATLANTA, GEORGIA
COURTESY OF E. J. GUMBEL



APP. I
FIGURE E
DEC. 1965

SOUTHEASTERN COMPREHENSIVE WATER POLLUTION CONTROL PROJECT

TALLAHALA CREEK AT LAUREL, MISS.
MINIMUM DAILY FLOW ANALYSIS
MAY

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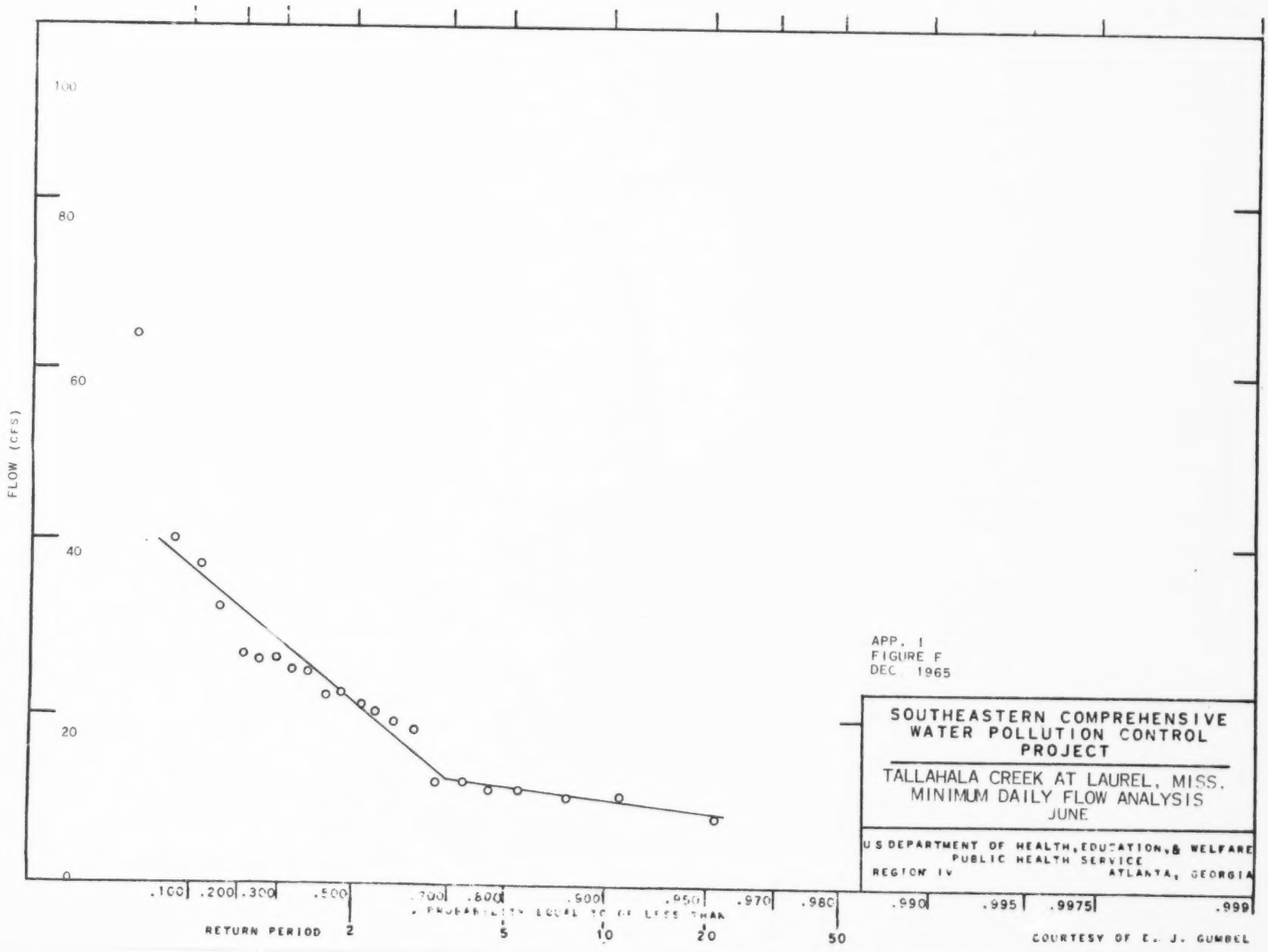
PUBLIC HEALTH SERVICE
REGION IV ATLANTA, GEORGIA

62A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RETURN PERIOD
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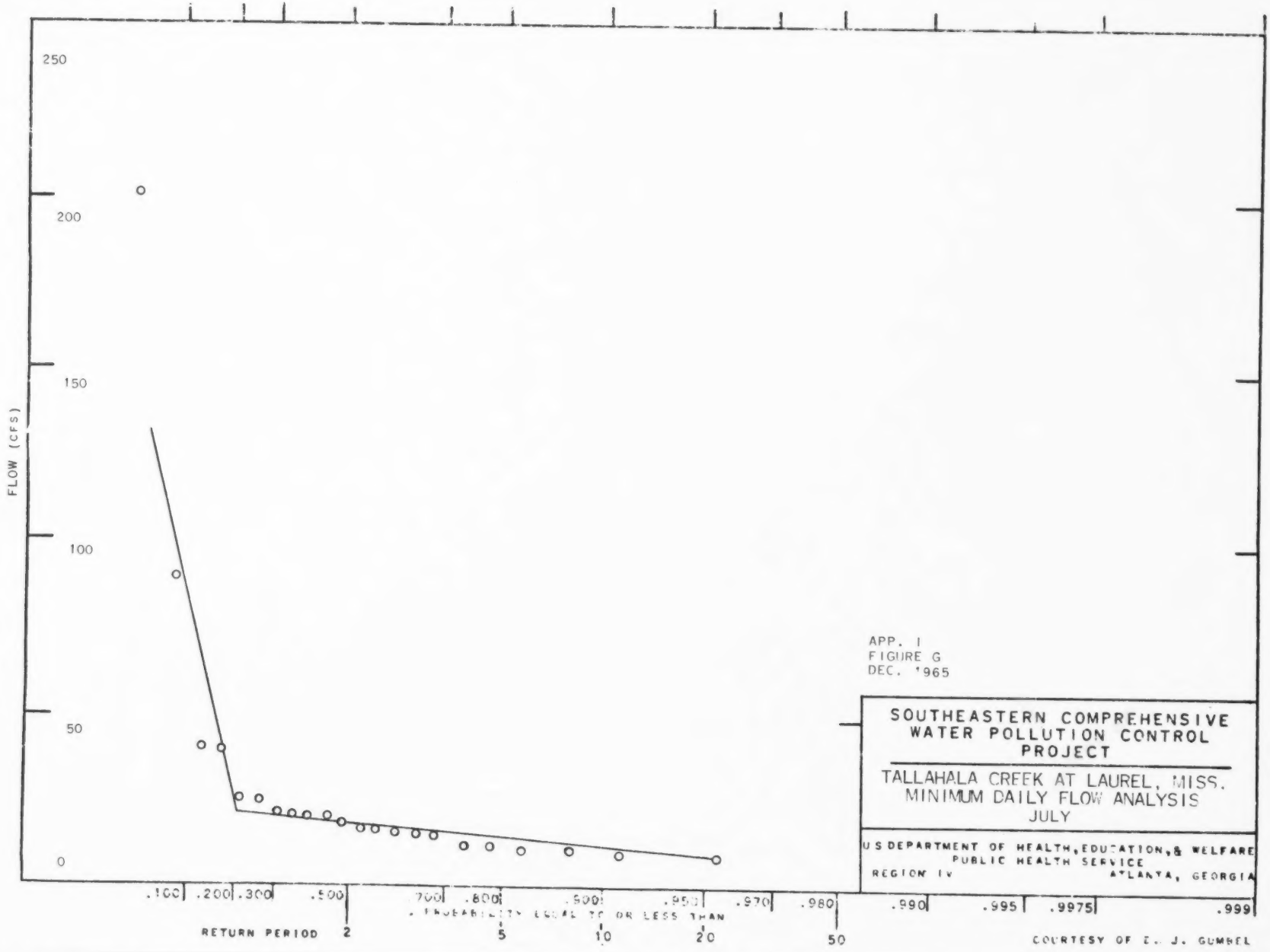
APP. I
FIGURE F
DEC. 1965
SOUTHEASTERN COMPREHENSIVE WATER POLLUTION CONTROL PROJECT
TALLAHALA CREEK AT LAUREL, MISS.
MINIMUM DAILY FLOW ANALYSIS
JUNE
U.S. DEPARTMENT OF HEALTH, EDUCATION, & WELFARE
PUBLIC HEALTH SERVICE
REGION IV
ATLANTA, GEORGIA
COURTESY OF E. J. GUMBEL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PROBABILITY EQUAL TO OR LESS THAN
RETURN PERIOD
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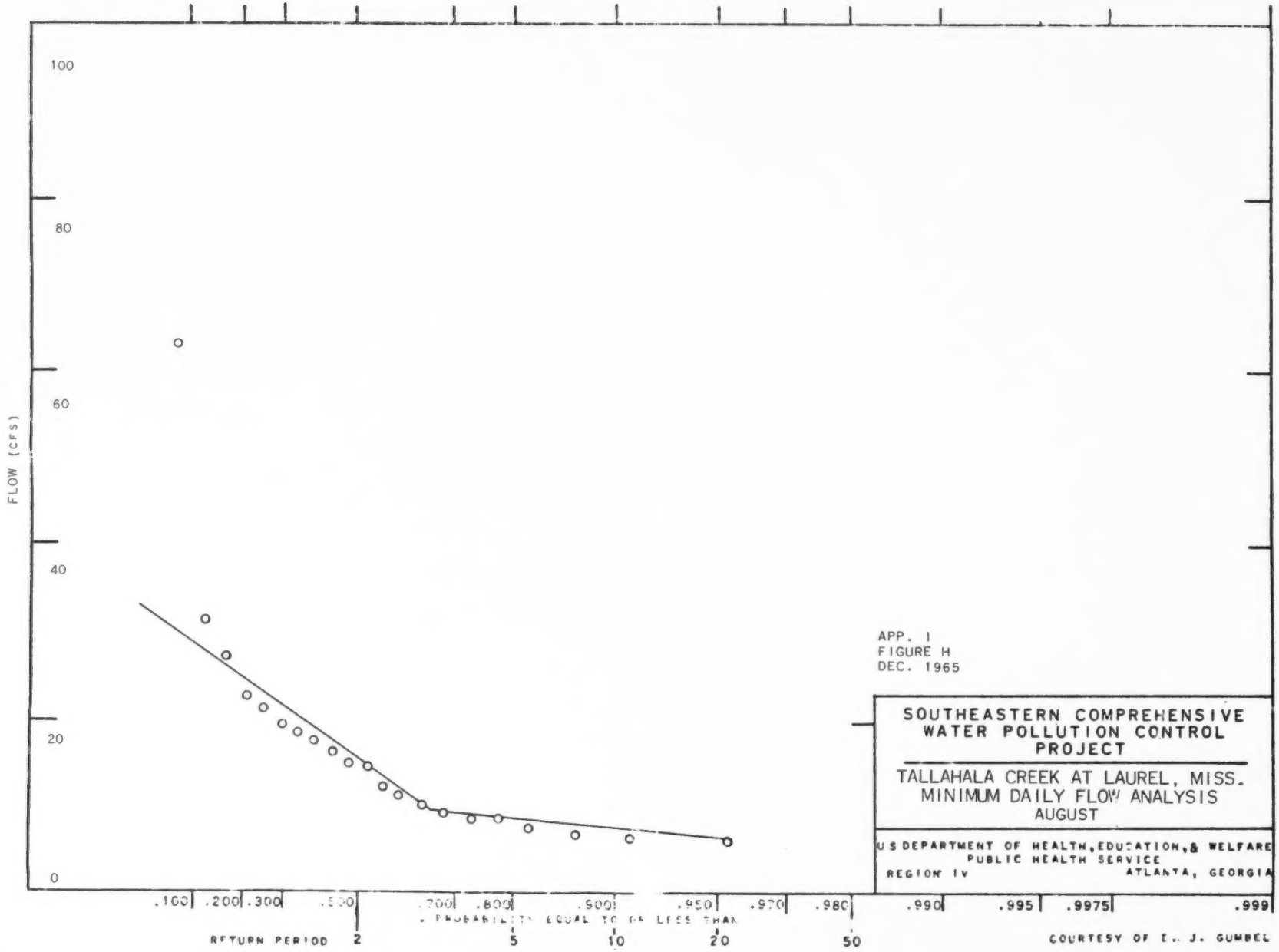
APP. I
FIGURE G
DEC. '1965
SOUTHEASTERN COMPREHENSIVE WATER POLLUTION CONTROL PROJECT
TALLAHALA CREEK AT LAUREL, MISS.
MINIMUM DAILY FLOW ANALYSIS
JULY
U S DEPARTMENT OF HEALTH, EDUCATION, & WELFARE
PUBLIC HEALTH SERVICE
REGION IV
ATLANTA, GEORGIA
COURTESY OF E. J. GUMBEL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PROBABILITY EQUAL TO OR LESS THAN
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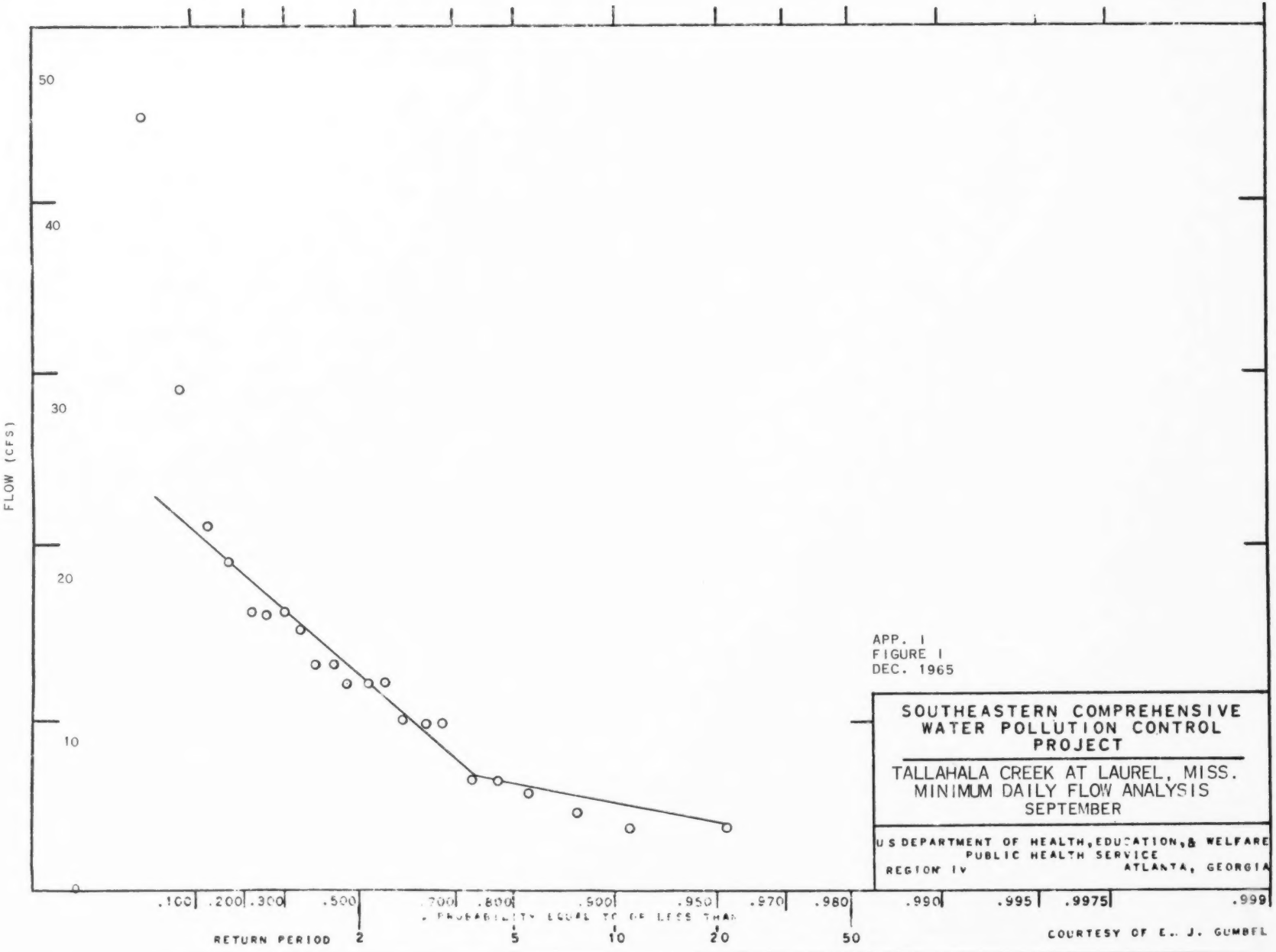
APP. I
FIGURE H
DEC. 1965
SOUTHEASTERN COMPREHENSIVE WATER POLLUTION CONTROL PROJECT
TALLAHALA CREEK AT LAUREL, MISS.
MINIMUM DAILY FLOW ANALYSIS
AUGUST
U S DEPARTMENT OF HEALTH, EDUCATION, & WELFARE
PUBLIC HEALTH SERVICE
REGION IV ATLANTA, GEORGIA
COURTESY OF E. J. GUMBEL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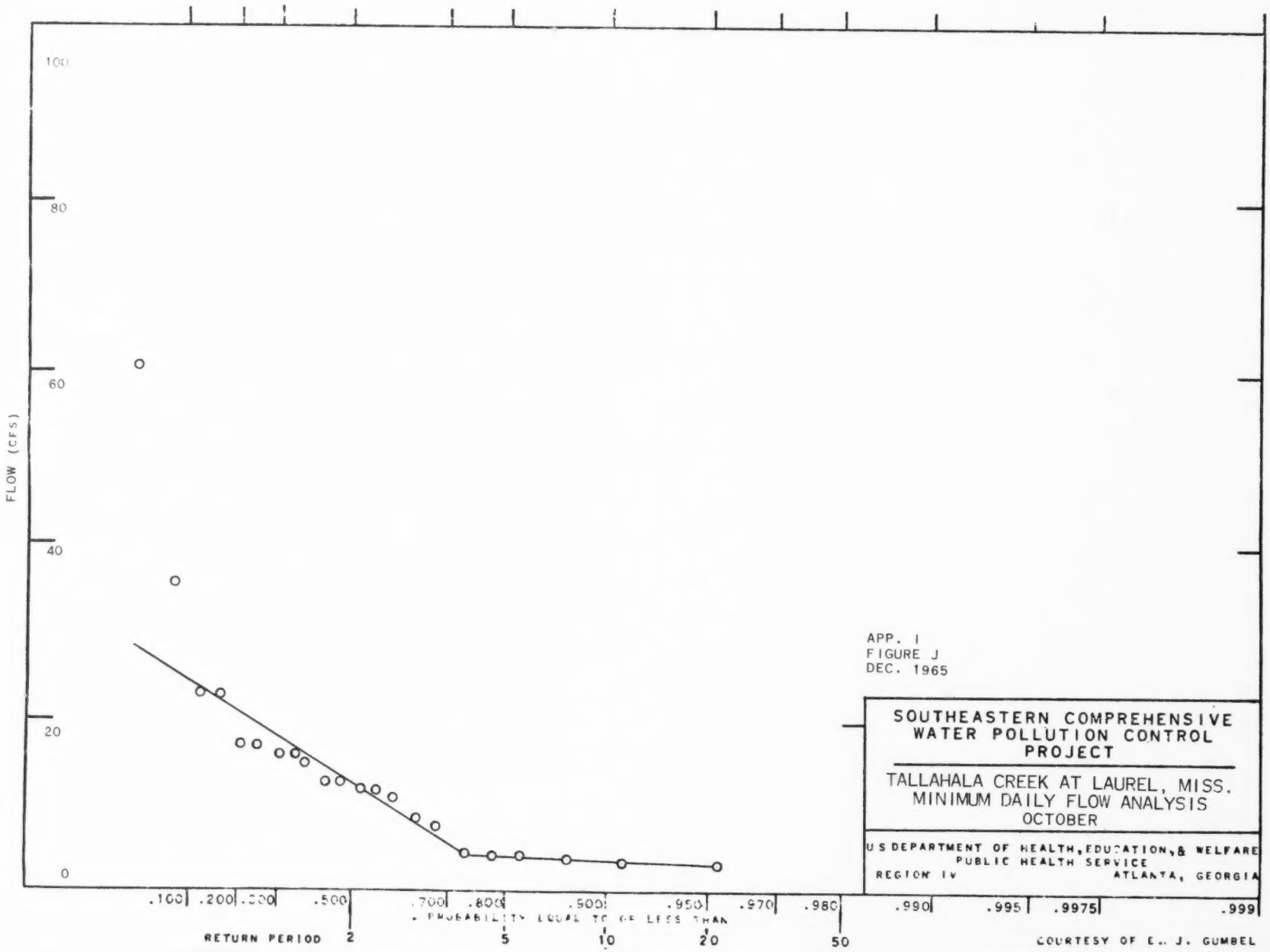
APP. I
FIGURE I
DEC. 1965
SOUTHEASTERN COMPREHENSIVE WATER POLLUTION CONTROL PROJECT
TALLAHALA CREEK AT LAUREL, MISS.
MINIMUM DAILY FLOW ANALYSIS
SEPTEMBER
U S DEPARTMENT OF HEALTH, EDUCATION, & WELFARE
PUBLIC HEALTH SERVICE
REGION IV
ATLANTA, GEORGIA
COURTESY OF E. J. GUMBEL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PROBABILITY EQUAL TO OR LESS THAN
RETURN PERIOD
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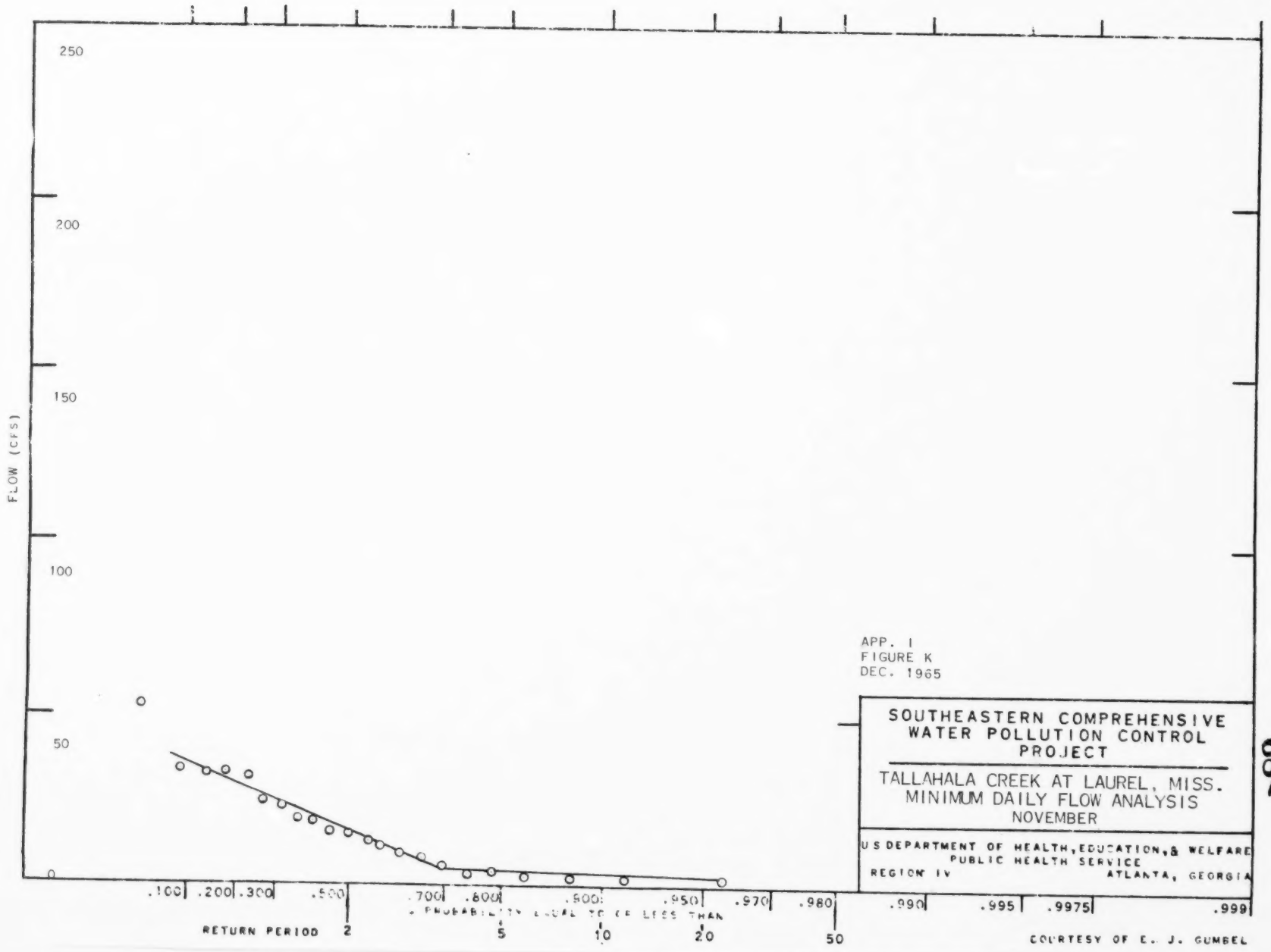
APP. I
FIGURE J
DEC. 1965
SOUTHEASTERN COMPREHENSIVE WATER POLLUTION CONTROL PROJECT
TALLAHALA CREEK AT LAUREL, MISS.
MINIMUM DAILY FLOW ANALYSIS
OCTOBER
U S DEPARTMENT OF HEALTH, EDUCATION, & WELFARE
PUBLIC HEALTH SERVICE
REGION IV
ATLANTA, GEORGIA
COURTESY OF E. J. GUMBEL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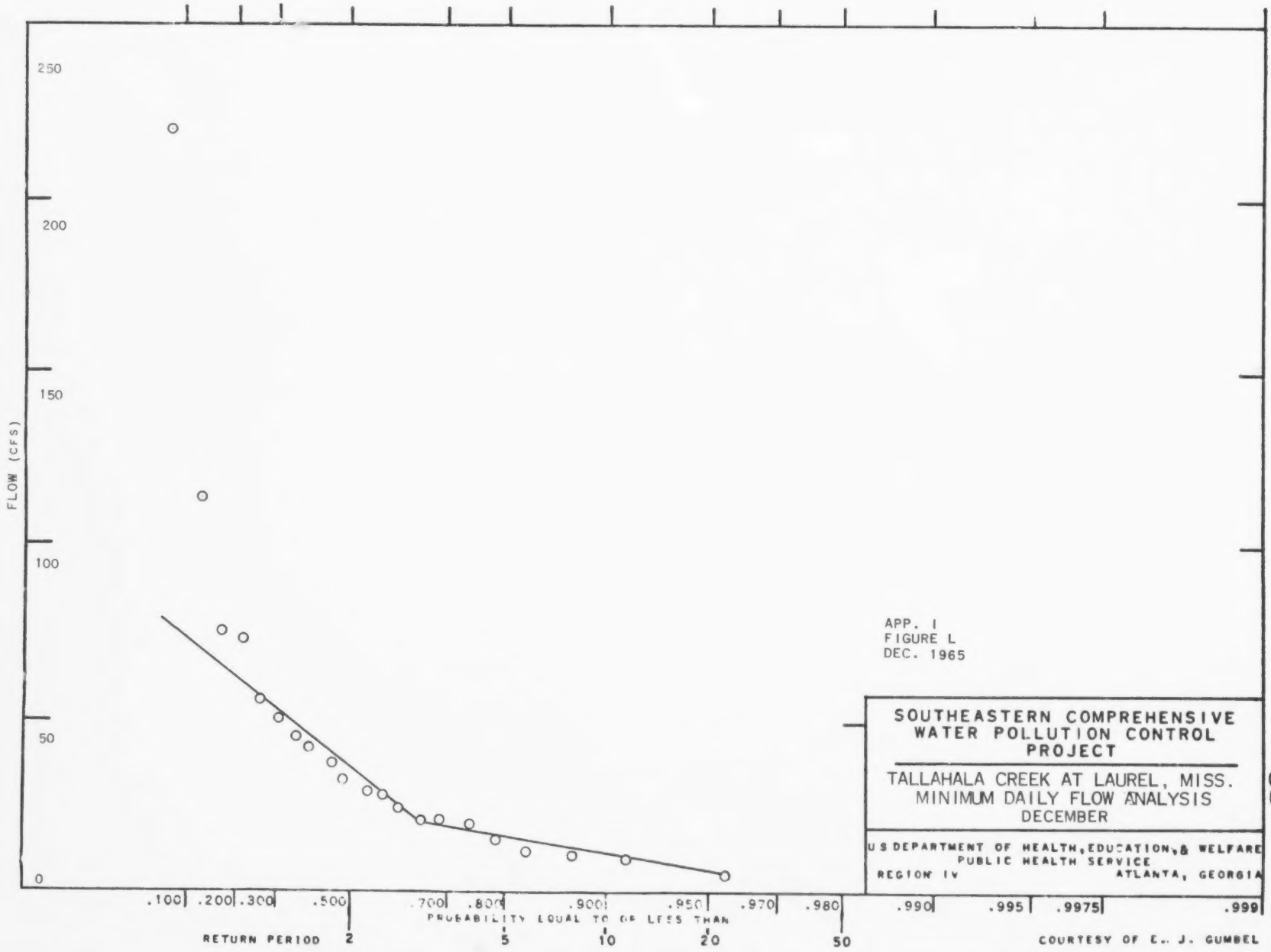
APP. I
FIGURE K
DEC. 1965
SOUTHEASTERN COMPREHENSIVE WATER POLLUTION CONTROL PROJECT
TALLAHALA CREEK AT LAUREL, MISS.
MINIMUM DAILY FLOW ANALYSIS
NOVEMBER
U S DEPARTMENT OF HEALTH, EDUCATION, & WELFARE
PUBLIC HEALTH SERVICE
REGION IV
ATLANTA, GEORGIA
COURTESY OF E. J. GUMBEL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150
100
50
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FLOW (CFS)
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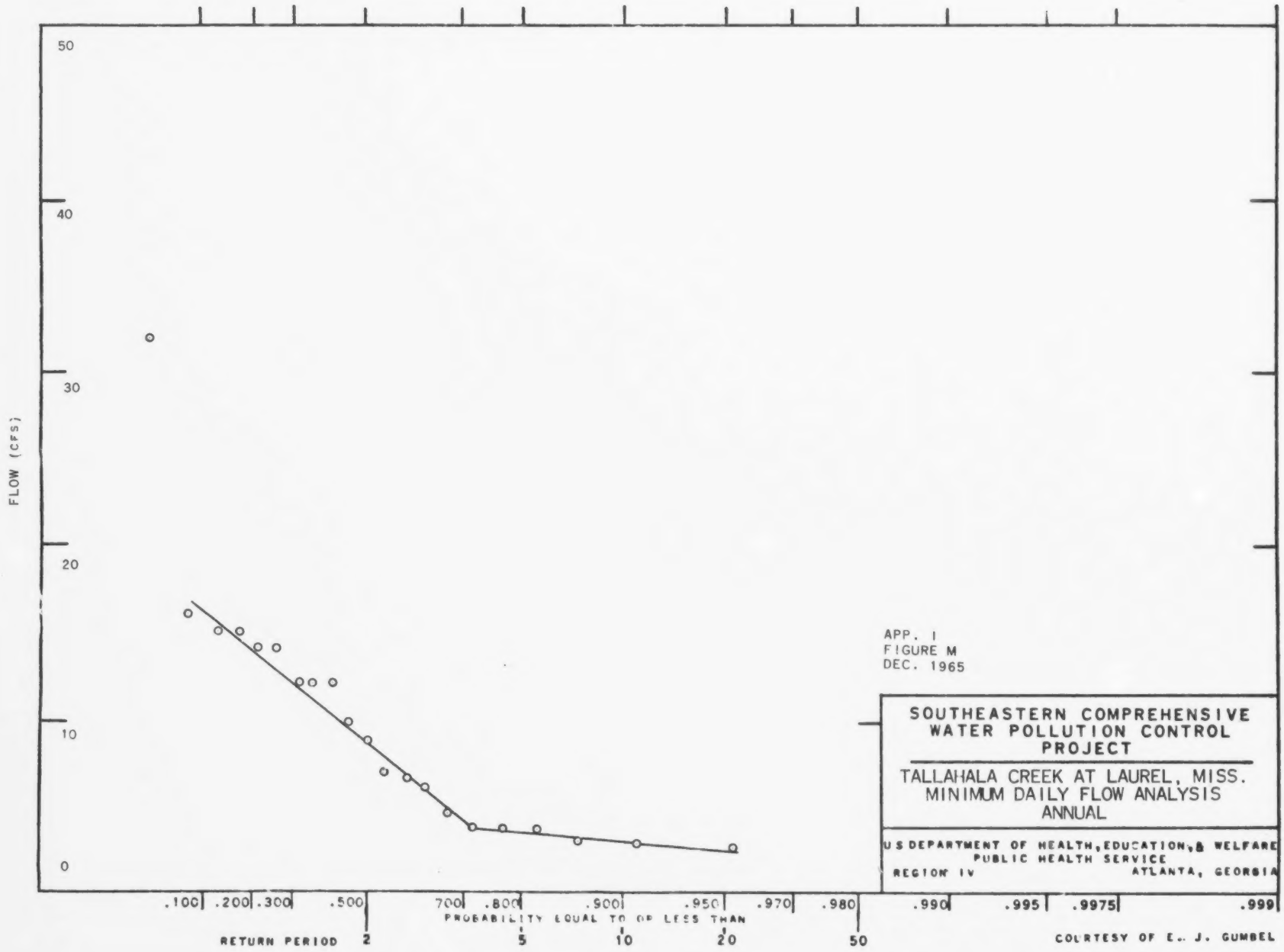
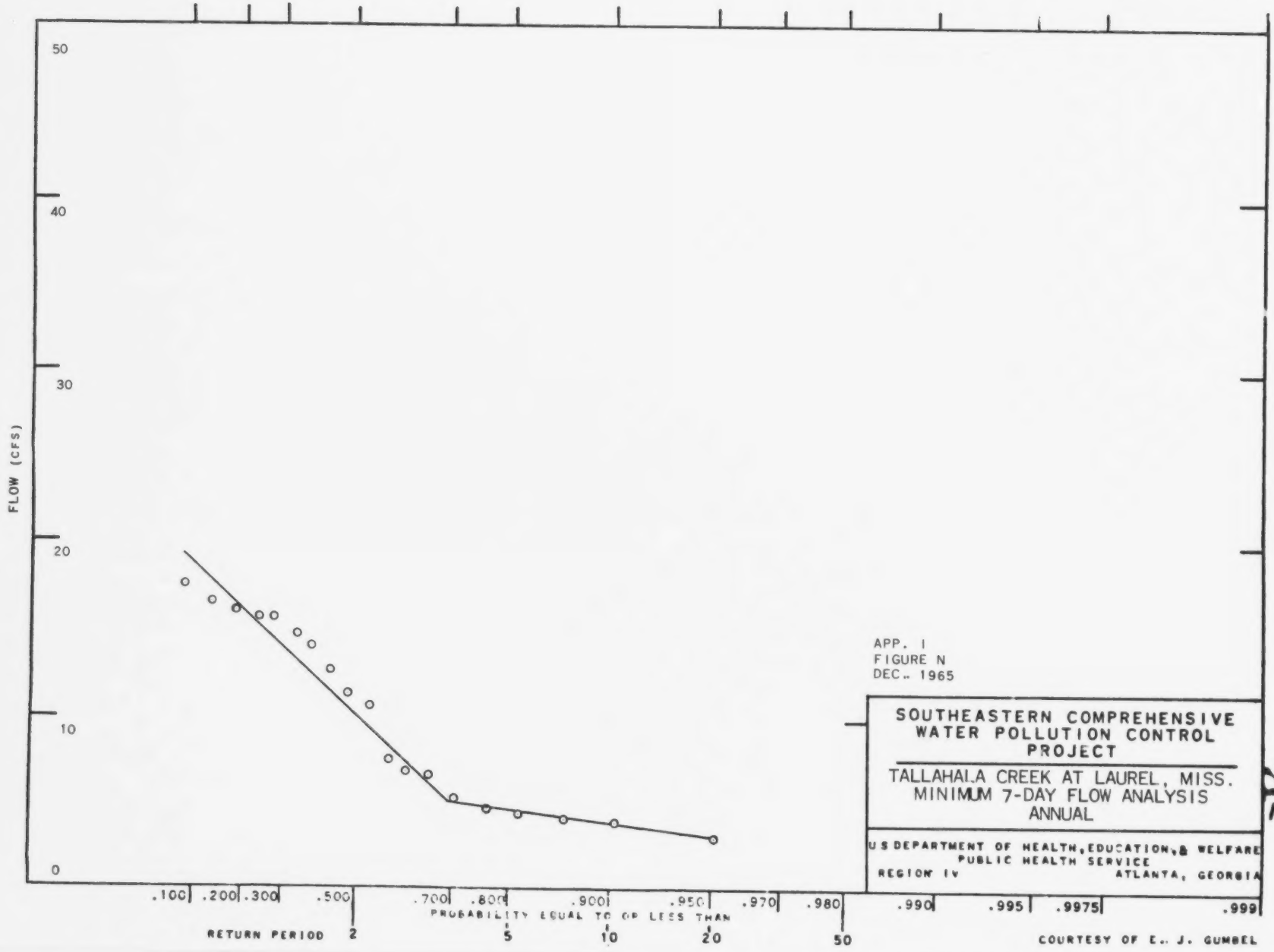
.200
.300
.500
.700
.800
.900
.950
.970
.980
.990
.995
.9975
.999
PROBABILITY EQUAL TO OR LESS THAN
RETURN PERIOD 2 5 10 20 50
APP. I
FIGURE L
DEC. 1965
SOUTHEASTERN COMPREHENSIVE WATER POLLUTION CONTROL PROJECT
TALLAHALA CREEK AT LAUREL, MISS.
MINIMUM DAILY FLOW ANALYSIS
DECEMBER
U S DEPARTMENT OF HEALTH, EDUCATION, & WELFARE
PUBLIC HEALTH SERVICE
REGION IV ATLANTA, GEORGIA
COURTESY OF E. J. GUMBEL


50
40
30
20
10
0
FLOW (CFS)
.100
.200
.300
.500
.700
.800
.900
.950
.970
.980
.990
.995
.9975
.999
PROBABILITY EQUAL TO OR LESS THAN
RETURN PERIOD
2
5
10
20
50
APP. I
FIGURE M
DEC. 1965
SOUTHEASTERN COMPREHENSIVE WATER POLLUTION CONTROL PROJECT
TALLAHALA CREEK AT LAUREL, MISS.
MINIMUM DAILY FLOW ANALYSIS
ANNUAL
U.S DEPARTMENT OF HEALTH, EDUCATION, & WELFARE
PUBLIC HEALTH SERVICE
REGION IV
ATLANTA, GEORGIA
COURTESY OF E. J. GUMBEL


50
40
30
20
10
0
FLOW (CFS)
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.200
.300
.500
.700
.800
.900
.950
.970
.980
.990
.995
.9975
.999
PROBABILITY EQUAL TO OR LESS THAN
RETURN PERIOD
2
5
10
20
50
APP. I
FIGURE N
DEC., 1965
SOUTHEASTERN COMPREHENSIVE WATER POLLUTION CONTROL PROJECT
TALLAHALA CREEK AT LAUREL, MISS.
MINIMUM 7-DAY FLOW ANALYSIS
ANNUAL
U.S. DEPARTMENT OF HEALTH, EDUCATION, & WELFARE
PUBLIC HEALTH SERVICE
REGION IV
ATLANTA, GEORGIA
COURTESY OF E. J. GUMBEL

TABLE A

TALLAHALA CREEK
SUMMARY OF MINIMUM DAILY FLOW ANALYSES BY MONTHS
USING GUMBELL'S METHOD OF EXTREME OCCURANCES
(cfs)

Month	1 in 5 yrs.	1 in 10 yrs.	1 in 20 yrs.
January	55	20	15
Feburary	95	60	30
March	95	70	40
April	65	50	35
May	25	20	15
June	11	10	9
July	14	12	10
August	8	7	6
September	6	5	4
October	4	3	2
November	10	8	5
December	35	25	15

TABLE B

TALLAHALA CREEK
AMOUNT OF STORAGE REQUIRED TO AUGMENT NATURAL FLOWS

Month	Natural Flow	Required Flow	Augment Flow		
			cfs	cf/mo. 10^6	ac.ft./mo.
January	20	10	0	--	--
February	60	10	0	--	--
March	70	25	0	--	--
April	50	30	0	--	--
May	20	35	15	40.3	925
June	10	50	40	103.5	2,380
July	12	50	38	102.0	2,340
August	7	50	43	115.0	2,640
September	5	50	45	116.5	2,680
October	3	35	32	86.0	1,970
November	8	20	12	31.1	715
December	25	10	0	--	--
			TOTAL		13,650 ac.ft./yr.

APPENDIX 2

DESCRIPTION OF SURFACE WATER QUALITY SURVEY AND ANALYSES

Number	Title
Table A	Detailed Descriptions of Sampling Stations
B	Results of Water Quality Surveys
Figure A	Time of Travel from Station 3
B	Long-Term BOD at Station 3

WATER QUALITY SURVEY AND ANALYSIS

Beginning the end of February 1965, a month long survey in the study area was initiated. The purpose of this survey was to obtain the necessary data needed for the evaluation of water requirements for water quality maintenance. This was the first of two surveys conducted for this purpose. Winter conditions (high flow) were studied since prior information indicated that industrial waste discharges during this period were much greater than during the low flow summer and fall periods. A second purpose of both surveys was to determine the magnitude of this same industrial waste discharge since inventory information was not available. The summer survey was initiated in the beginning of June and continued on a periodic basis to the beginning of August. The location of sampling stations used during both surveys is shown in Figure 2 and a listing of station descriptions is given in this Appendix. Mississippi State Highway Department maps were used to locate the stations. Stream mileage measurements developed by the Southeastern Comprehensive Water Pollution Control Project for its comprehensive study of the Pascagoula River Basin and included in its STORET data retrieval system were used.

Reconnaissance studies indicated that dissolved oxygen (DO) and biochemical oxygen demand (BOD) parameters were of primary importance in projecting conditions in the stream. Bacteriological parameters (coliform bacteria) were also measured, but existing plans for municipal and industrial waste treatment indicated that this would not be a problem in the future.

During the winter survey, a trailer laboratory which had been set up in Pascagoula, Mississippi, was used to perform the routine analyses for dissolved oxygen, coliform, pH, chlorides, and other chemical parameters. Composite samples for long-term BOD analyses were airmailed to the Atlanta laboratory of the Southeastern Comprehensive Water Pollution Control Project.

During the summer survey, the trailer laboratory was located in Hattiesburg, Mississippi, and routine analyses were performed there. Long-term BOD analyses were conducted in the Atlanta laboratory as before. The results of all these analyses are contained in this Appendix. All analyses were performed according to the procedures outlined in Standard Methods for the Examination of Water and Waste Water.

During both the winter and summer surveys, time-of-passage studies using dye-tracing techniques were conducted. Dumps of Rhodamine-B dye were made and traced by use of Turner Company fluorometers. The results of these studies are also contained herein. Streamflows at the sampling stations were obtained from the U. S. Geological Survey, who provided rating curves for these stations.

During the first two weeks of the winter survey, dissolved oxygen levels were above 4.0 mg/l with waste loads entering from the Laurel area ranging from 412,000 to 872,000 lbs. per day of 5-day BOD. Water temperature averaged 14° C, and streamflow at Station 3 (at Laurel) averaged 770 cfs. During the last two weeks of the survey, the waste load was greatly increased to about 2,000,000 lbs. per day

and dissolved oxygen levels fell to 3.0 mg/1 in a 16-mile reach between Stations 7 and 9 and remained below 4.0 mg/1 at Station 10 another 12 miles downstream. The average flow at Station 3 during this period was 600 cfs.

During the summer survey, the waste load to the stream averaged 25,000 lbs. of 5-day BOD per day. This resulted in a depressed oxygen level (below 4.0 mg/1) in practically the entire reach of Tallahala Creek. From Stations 4 to 7, a distance of 23 miles, oxygen was below 2.0 mg/1, and just below Station 4 it was practically zero. The average flow at Station 3 during this period was 23 cfs, and the temperature was 28^{o} C.

Bacteriological levels downstream from Laurel were high during both surveys. Median coliform counts at Station 4 ranged from 920,000 per 100 ml in the winter to 1,600,000,000 per 100 ml in the summer. Die-off rates were high, especially during the low flow summer period, and levels were reduced significantly before entrance to Leaf River. Water quality in the upstream areas of both Tallahala and Tallahoma Creeks (above Laurel) was satisfactory with the possible exception of coliform levels.

Long-term (up to 20 days) BOD determinations were made on samples from the stream so that the rate of deoxygenation and ultimate BOD values could be determined. The ultimate BOD values were used to determine the present pollutional loads discharged to the stream. A typical curve is shown in this Appendix.

The results of the summer survey showed that the average waste load entering Tallahala Creek from the Laurel area was 24,700 lbs. of 5-day BOD per day in a waste flow of 25 cfs. The average streamflow at Station 3 was 23 cfs.

The results of the long-term BOD determinations gave a deoxygenation constant, K_D, of 0.149 per day at 28° C (average summer temperature). The results of the 5-day BOD determinations at the downstream stations gave the stream rate of removal, K_r, of 0.1 per day at 28° C.

Because of the lack of data on physical stream characteristics (i.e., depth, cross-sections, velocity), it was not possible to calculate the reaeration rate, K_2, directly using methods developed by Velz, O'Connor, and Churchill. It was necessary to calculate the reaeration rate indirectly using the basic Streeter-Phelps equation. Because of the significant difference in stream characteristics during the high (winter) and low (summer) flow periods, two separate sets of deoxygenation, stream removal, and reaeration rates were calculated. Winter rates were calculated based on the data collected during the week of March 1-5 since that more represented a period of steady-state conditions than the other winter periods. Summer rates were calculated based on all the data collected during the survey period because of the prevalence of relatively stable conditions during the entire period.

Once the stream rates were determined for both summer and winter periods, these rates were used in calculating future streamflow and waste load requirements for Tallahala Creek at and below Laurel. The results of these analyses are given in the report as allowable loading curves and streamflow requirement curves (Figures 7, 8, and 9).

A sample calculation is as follows:

Winter Period (March 1-5, 1965)

Basic Data:
Upstream DO = 9 mg/l
Upstream Q = 769 cfs
Upstream temp. = 11° C
Upstream loads = 8,600 lbs. BOD/day

Waste DO = 0.0 mg/l
Waste Q = 444 cfs
Waste temp. = 15° C (E)
Waste loads = 872,200 lbs. BOD/day

K_D (from long-term BOD's) = .0615 @ 14° C
K_r (from BOD loading curves) = .079 @ 14° C
T_c (from DO sag curve) = 24 hours

Calculations:

$$\text{DO mix} = \frac{9(769) + 0.0(444)}{1213} = 5.6$$

$$D_o = 11.1 - 5.6 = 5.5$$

$$\text{L mix} = 769\left(\frac{8,600}{769 \times 5.4}\right) + 444\left(\frac{872,200}{444 \times 5.4}\right) = \frac{1590 + 161,500}{1213}$$

$$= \frac{163,090}{1213} = 134 \text{ mg/l}$$

$$L_o = \frac{134}{1 - 10^{(.0615)(5)}} = \frac{134}{1 - .493} = \frac{134}{1507} = 265 \text{ mg/l}$$

Streeter-Phelps Equation for critical time (with O'Connor modification)

$$T_c = \frac{1}{K_2 - K_r} \log \frac{K_2}{K_r}\left(1 - \frac{D_o(K_2 - K_r)}{K_D L_o}\right)$$

$$1 \text{ day} = \frac{1}{K_2 - .079} \log \frac{K_2}{.079}\left(1 - \frac{5.5(K_2 - .079)}{.0615(265)}\right)$$

$$\frac{1}{K_2 - .079} \log \frac{K_2}{.079}\left(1 - .338(K_2 - .079)\right)$$

Trial and error solution gives K_2 = 0.8/day @ 14° C.

TABLE A

DESCRIPTION OF SAMPLING STATIONS

TALLAHALA CREEK

Station 1 -- Sec. 35, T10N, R11W, at bridge on county road east of Sandersville, Jones County, Stream mile 67.90, STORET code no. 274890.

Station 2 -- Sec. 33, T9N, R11W, bridge on Interstate Hwy. 59, in Laurel, Jones County, Stream mile 58.10, STORET code no. 274870.

Station 3 -- Sec. 8, T8N, R11W, bridge on State Hwy. 15, in Laurel, Jones County, stream mile 54.60, STORET code no. 274850.

Station 4 -- Sec. 18, T8N, R11W, bridge on county road, south of Laurel, Jones County, stream mile 51.10, STORET code no. 274830.

Station 6 -- Sec. 35, T8N, R12W, bridge on county road at Ellisville city limit, Jones County, stream mile 45.00, STORET code no. 274795.

Station 7 -- Sec. 14, T6N, R12W, on bridge on gravel county road, 5 miles west of State Hwy. 29, south of Ellisville, Jones County, stream mile 28.40, STORET code no. 274750.

Station 8 -- Sec. 1, T5N, R12W, on bridge on gravel county road, 5 miles southwest of State Hwy. 29, east of Morriston, Forrest County, stream mile 22.48, STORET code no. 274740.

Station 9 -- Sec. 8-9 line, T4N, R11W on bridge on county road, 3 miles south of State Hwy. 42 and Runnelstown, Perry County, stream mile 12.20 STORET code no. 274730.

Station 10 -- Sec. 10, T3N, R11W, on bridge on county road, 1 mile west of State Hwy. 29, at mouth of Tallahala Creek, Perry County, stream mile 0.40, STORET code no. 274702.

TALLAHOMA CREEK

Station 5 -- Sec. 15, T8N, R12W, county road at Laurel city limit, Stream mile 6.20, STORET code no. 274940.

TABLE B

RETRIEVAL DATE: 01/04/66

274890
TALLAHALLA CR W SANDERSVILLE
MISSISSIPPI
SOUTHEAST
PASCAGOULA
AGENCY: 603200 TYPE: 002

DATE FROM TO	TIME OF DAY	00010 WATER TEMP CENT	00060 STREAM FLOW CUFT/SEC	00300 DO MG/L	00301 DO SATUR PERCENT	00310 BOD 5 DAY MG/L	00400 PH S U	00410 T ALK CACO3 MG/L	00940 CHLORIDE CL MG/L	31505 COLIFORM MPN CONF /100ML	31615 FEC COLI EC 44.5 T./100ML
02 23 65	1204	11.0	-	9.8	88.0	0.2	6.50	-	21	940	220
02 25 65	0950	10.0	-	10.1	89.0	2.5	6.10	-	20	54000	5000
02 26 65	1030	10.0	-	10.3	91.0	1.8	6.40	-	13	13000	3300
03 01 65	1137	12.0	-	9.8	-	1.0	7.10	-	13	2200	490
03 02 65	1137	15.0	-	8.5	84.0	0.8	6.50	-	13	34800	7000
03 03 65	1029	14.0	-	8.8	85.0	1.4	6.40	-	5	22100	4900
03 04 65	1100	12.0	-	8.0	74.0	1.0	6.30	-	2	24000	940
03 05 65	1029	11.0	-	9.4	85.0	1.5	6.60	-	7	3300	1090
03 08 65	1025	9.0	-	11.6	100.0	1.9	5.30	-	32	1300	270
03 09 65	1007	10.0	-	12.0	106.0	2.6	6.80	-	29	1720	170
03 10 65	1052	10.0	-	11.4	100.0	2.3	6.30	-	27	1300	130
03 11 65	1004	12.0	-	11.0	101.0	2.3	6.20	-	23	13000	1090
03 12 65	1008	12.0	-	11.0	101.0	3.2	7.50	-	19	7900	1720
03 15 65	1014	13.0	-	10.6	100.0	5.6	6.20	-	7	3300	1090
03 19 65	1059	15.0	-	9.0	89.0	3.2	6.60	-	15	7900	1700
03 22 65	1055	11.0	-	10.3	93.0	4.2	6.20	-	22	3300	-
03 26 65	1000	17.0	-	8.4	86.0	3.2	6.50	-	27	1720	90
06 03 65	0851	25.0	-	7.2	88.0	2.2	7.40	-	65	7000	140
06 07 65	1000	24.0	-	6.5	76.0	0.9	6.60	-	64	1720	170
06 09 65	0950	24.0	-	4.0	21.0	-	7.10	-	-	2210	460
06 11 65	0945	25.0	-	6.7	80.0	0.0	6.80	-	50	3300	60
06 15 65	0948	24.0	-	6.3	74.0	-	6.80	-	100	4900	50
07 19 65	0910	26.0	-	6.2	76.0	4.4	7.20	-	81	34800	140
07 21 65	0930	27.0	-	6.0	74.0	1.2	7.10	-	45	4600	90
07 23 65	0925	27.0	-	6.6	81.0	1.5	6.80	-	40	5420	80
07 27 65	0935	27.0	-	6.0	74.0	2.8	7.00	-	36	24000	-
07 29 65	0920	26.0	-	6.6	81.0	1.9	6.70	-	22	4900	1100
08 02 65	0915	25.0	-	8.0	95.0	2.7	6.30	-	30	3480	3480
08 03 65	1110	26.0	-	6.8	83.0	2.9	6.50	-	28	7900	260
08 04 65	1115	25.0	-	6.8	81.0	2.8	6.60	-	28	5420	130
08 05 65	1100	26.0	-	7.0	86.0	3.2	6.70	-	31	2300	50
08 06 65	1105	25.0	-	6.4	76.0	4.0	6.40	-	36	9200	50

83A

RETRIEVAL DATE: 01/04/66

274890
TALLAHALLA CR w SANDERSVILLE
MISSISSIPPI
SOUTHEAST
PASCAGOULA
AGENCY: 603200 TYPE: 002

DATE FROM TO	TIME OF DAY	00003 VSAMPLOC DEPTH FEET	00070 TURB JKSN JU	00095 CNDUCTVY AT 25C MICROMHO	00340 COD HI LEVEL MG/L	00900 TOT HARD CACO3 MG/L	00910 CALCIUM CACO3 MG/L	00920 MGNSIUM CACO3 MG/L	01045 IRON TOTAL UG/L	01055 MANGNESE MN UG/L	31677 STPCOCCI AD-EVA BR-100ML
02 23 65	1204	-	-	-	-	25	18.0	7.0	-	-	-
02 25 65	0950	-	-	-	-	25	20.0	5.0	-	-	-
02 26 65	1030	-	-	-	-	12	12.0	0.0	-	-	-
03 01 65	1137	-	-	-	-	26	22.0	4.0	-	-	-
03 02 65	1137	-	-	-	-	18	10.0	8.0	-	-	-
03 03 65	1029	-	-	-	-	22	16.0	6.0	-	-	-
03 04 65	1100	-	-	-	-	18	14.0	4.0	-	-	-
03 05 65	1029	-	-	-	-	18	16.0	2.0	-	-	-
03 08 65	1025	-	-	-	-	30	26.0	4.0	-	-	-
03 09 65	1007	-	-	-	-	22	8.0	14.0	-	-	-
03 10 65	1052	-	-	-	-	32	26.0	6.0	-	-	-
03 11 65	1004	-	-	-	-	36	26.0	10.0	-	-	-
03 12 65	1008	-	-	-	-	26	18.0	8.0	-	-	-
03 15 65	1014	-	-	-	-	18	14.0	4.0	-	-	-
03 19 65	1059	-	-	-	-	26	16.0	10.0	-	-	1600.0L
03 22 65	1055	-	-	-	-	30	22.0	8.0	-	-	110.0
03 26 65	1000	-	-	-	-	36	26.0	10.0	-	-	110.0
06 03 65	0851	-	-	250	-	44	34.0	10.0	-	-	-
06 07 65	1000	-	-	215	-	46	30.0J	16.0J	-	-	-
06 11 65	0945	-	-	-	-	-	26.0	-	-	-	-
06 15 65	0948	-	-	250	-	-	40.0	-	-	-	-
07 19 65	0910	-	-	240	-	-	-	-	2	0.0	-
07 21 65	0930	-	-	190	-	35	22.0	13.0	-	-	-
07 23 65	0925	-	-	-	-	32	24.0	8.0	-	-	-
07 27 65	0935	-	-	144	-	30	22.0	8.0	-	8.0	-
07 29 65	0920	-	-	83	-	24	14.0	10.0	-	-	-
08 02 65	0915	-	-	100	-	-	-	-	13	1.0	-
08 03 65	1110	-	-	100	-	-	-	-	15	-	-
08 04 65	1115	-	-	99	-	-	-	-	-	-	-
08 05 65	1100	-	-	160	-	-	-	-	-	-	-
08 06 65	1105	-	-	120	-	-	-	-	60	-	-

RETRIEVAL DATE: 01/04/66

274870
TALLAHALLA CR DNT HWY 59 LAUREL
MISSISSIPPI
SOUTHEAST
PASCAGOULA
AGENCY: 603200 TYPE: 002

DATE FROM TO	TIME OF DAY	00003 VSAMPLOC DEPTH FEET	00070 TURB JKSN JU	00095 CNDUCTVY AT 25C MICROMHO	00340 COD HI LEVEL MG/L	00900 TOT HARD CACO3 MG/L	00910 CALCIUM CACO3 MG/L	00920 MGNSIUM CACO3 MG/L	01045 IRON TOTAL UG/L	01055 MANGNESE MN UG/L	31677 STPCOCCI AD-EVA BR-100ML
06 03 65	0836	-	-	380	-	58	42.0	16.0	-	-	-
06 07 65	0940	-	-	380	-	62	46.0	16.0	-	-	-
06 09 65	0930	-	-	350	-	-	42.0	-	-	-	-
06 11 65	0925	-	-	460	-	-	48.0	-	-	-	-
06 15 65	0930	-	-	285	-	-	38.0	-	-	-	-
07 19 65	0850	-	-	165	-	30	22.0	8.0	-	-	-
07 21 65	0910	-	-	195	-	29	20.0	9.0	-	-	-
07 23 65	0910	-	-	280	-	52	40.0	12.0	-	-	-
07 29 65	0900	-	-	660	-	88	70.0	18.0	-	-	-

85A

RETRIEVAL DATE: 01/04/66

274870
TALLAHALLA CR DNT HWY 59 LAUREL
MISSISSIPPI
SOUTHEAST
PASCAGOULA
AGENCY: 603200 TYPE: 002

DATE FROM TO	TIME OF DAY	00010 WATER TEMP CENT	00060 STREAM FLOW CUFT/SEC	00300 DO MG/L	00301 DO SATUR PERCENT	00310 BOD 5 DAY MG/L	00400 PH S U	00410 T ALK CACO3 MG/L	00940 CHLORIDE CL MG/L	31505 COLIFORM MPN CONF /100ML	31615 FEC COLI EC 44.5 T./100ML
06 03 65	0836	25.0	-	5.8	69.0	1.0	7.30	-	108	24000	1300
06 07 65	0940	24.0	-	4.7	55.0	4.8	6.40	-	122	54200	4900
06 09 65	0930	26.0	-	4.8	59.0	4.8L	6.90	-	115	92000	27800
06 11 65	0925	25.0	-	5.1	61.0	2.9	6.60	-	149	14000	2000
06 15 65	0930	24.0	-	3.3	39.0	18.0	6.80	-	100	24000	2780
07 19 65	0850	27.0	-	4.3	53.0	3.2	6.80	-	47	54200	13000
07 21 65	0910	28.0	-	4.5	57.0	5.2	6.80	-	52	54200	5420
07 23 65	0910	27.0	-	4.6	57.0	1.3	7.00	-	97	24000	9200
07 27 65	0910	26.0	-	4.2	51.0	2.6	6.90	-	-	160000L	54200
07 29 65	0900	26.0	-	6.1	74.0	2.1	6.40	-	221	13000	0

RETRIEVAL DATE: 01/04/66

274850
TALLAHALA CR LAUREL HWY MISS 15
MISSISSIPPI
SOUTHEAST
PASCAGOULA
AGENCY: 603200 TYPE: 006

DATE FROM TO	TIME OF DAY	00010 WATER TEMP CENT	00060 STREAM FLOW CUFT/SEC	00300 DO MG/L	00301 DO SATUR PERCENT	00310 BOD 5 DAY MG/L	00400 PH S U	00410 T ALK CACO3 MG/L	00940 CHLORIDE CL MG/L	31505 COLIFORM MPN CONF /100ML	31615 FEC COLI EC 44.5 T./100ML
02 23 65	1103	11.0	1778	9.1	83.0	1.0	5.60	-	2075	160000	17200
02 25 65	0900	10.0	541	9.0	79.0	1.5	6.50	-	31	92000	17000
02 26 65	0855	10.0	653	10.3	91.0	2.8	6.80	-	20	34800	10900
03 01 65	1000	12.0	434	9.4	87.0	2.0	6.40	-	24	160000	54200
03 02 65	0850	15.0	923	8.3	82.0	0.9	6.20	-	18	92000	54200
03 03 65	0904	14.0	1058	8.6	83.0	1.7	6.30	-	7	22100	7900
03 04 65	0902	12.0	1060	9.5	88.0	1.9	6.20	-	16	14100	4900
03 05 65	0940	10.0	1125	9.4	83.0	1.8	6.40	-	6	160000	160000
03 08 65	0925	10.0	345	10.5	93.0	2.8	5.60	-	30	24000	24000
03 09 65	0922	10.0	276	11.0	97.0	2.2	6.50	-	30	34800J	24000
03 10 65	0901	11.0	251	11.2	101.0	4.1	-	-	29	34800	34800
03 11 65	0918	12.0	353	11.2	103.0	2.6	6.30	-	31	160000	54200
03 12 65	0925	13.0	568	10.0	94.0	3.4	6.70	-	30	34800	2400
03 15 65	0933	12.0	966	9.8	90.0	8.0	6.40	-	11	54200	13000
03 19 65	0925	14.0	724	8.6	83.0	4.4	4.50	-	23	54200	17200
03 22 65	1000	12.0	323	9.5	88.0	4.3	6.40	-	23	34500	-
03 26 65	1030	17.0	225	7.9	81.0	2.8	6.60	-	59	160000	24000
06 03 65	0810	25.0	12	5.5	65.0	5.3	7.00	-	115	2530	220
06 07 65	0925	25.0	21	4.2	50.0	4.2	6.60	-	122	2210	330
06 09 65	0915	25.0	-	6.9	82.0	3.6	6.80	-	116	7000	330
06 11 65	0910	25.0	10	4.3	51.0	7.4	6.30	-	111	13000	800
06 15 65	0912	24.0	14	5.1	60.0	0.6	6.60	-	90	160000	17200
07 19 65	0830	27.0	12	4.1	51.0	1.4	7.00	-	51	17000	0
07 21 65	0850	28.0	13	5.0	63.0	3.4	6.90	-	66	3000	490
07 23 65	0850	27.0	9	5.1	63.0	0.5	6.90	-	50	9200	490
07 27 65	0950	25.0	20	3.7	44.0	17.0	6.70	-	27	160000L	92000
07 29 65	0835	26.0	20	3.1	38.0	3.4	6.90	-	63	330000	130000
08 02 65	0845	26.0	49	6.7	82.0	0.2	6.40	-	37	130	40
	0950	-	-	-	-	25.2	-	-	30	-	-
08 03 65	1145	27.0	26	5.7	71.0	2.1	6.40	-	27	7000	230
08 04 65	1145	27.0	17	5.0	62.0	3.4	6.50	-	29	160000	54200
08 05 65	1135	26.0	13	5.4	66.0	1.9	6.10	-	41	7900	200K
08 06 65	1120	-	-	-	-	3.0	-	-	45	33000	2000
	1145	26.0	11	4.9	60.0	-	6.50	-	-	-	-

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RETRIEVAL DATE: 01/04/66

274950
TALLAHALA CR LAUREL HWY MISS 15
MISSISSIPPI
SOUTHEAST
PASCAGOULA
AGENCY: 603200 TYPE: 006

DATE FROM TO	TIME OF DAY	00003 VSAMPLOC DEPTH FEET	00070 TURB JKSN JU	00095 CNDUCTVY AT 25C MICROMHO	00340 COD HI LEVEL MG/L	00900 TOT HARD CACO3 MG/L	00910 CALCIUM CACO3 MG/L	00920 MGNSIUM CACO3 MG/L	01045 IRON TOTAL UG/L	01055 MANGNESE MN UG/L	31677 STPCOCCI AD-EVA BR-100ML
02 23 65	1103	-	-	-	-	31	16.0	15.0	-	-	-
02 25 65	0900	-	-	-	-	22	18.0	4.0	-	-	-
02 26 65	0855	-	-	-	-	24	14.0	10.0	-	-	-
03 01 65	1000	-	-	-	-	36	20.0	16.0	-	-	-
03 02 65	0850	-	-	-	-	18	12.0	6.0	-	-	-
03 03 65	0904	-	-	-	-	20	14.0	8.0	-	-	-
03 04 65	0902	-	-	-	-	22	14.0	8.0	-	-	-
03 05 65	0940	-	-	-	-	24	16.0	8.0	-	-	-
03 08 65	0925	-	-	-	-	30	24.0	8.0	-	-	-
03 09 65	0922	-	-	-	-	28	22.0	4.0	-	-	-
03 10 65	0901	-	-	-	-	30	24.0	6.0	-	-	-
03 11 65	0918	-	-	-	-	32	24.0	8.0	-	-	-
03 12 65	0925	-	-	-	-	36	22.0	14.0	-	-	-
03 15 65	0933	-	-	-	-	20	14.0	6.0	-	-	-
03 19 65	0925	-	-	-	-	28	20.0	8.0	-	-	-
03 22 65	1000	-	-	-	-	30	22.0	8.0	-	-	-
03 26 65	1030	-	-	-	-	42	26.0	16.0	-	-	-
06 03 65	0810	-	-	400	-	64	44.0	20.0	-	-	-
06 07 65	0925	-	-	400	-	62	48.0	14.0	-	-	-
06 09 65	0915	-	-	350	-	-	44.0	-	-	-	-
06 11 65	0910	-	-	350	-	-	46.0	-	-	-	-
06 15 65	0912	-	-	260	-	-	36.0	-	-	-	-
07 19 65	0830	-	-	175	-	30	22.0	8.0	-	-	-
07 21 65	0850	-	-	240	-	36	22.0	12.0	-	-	-
07 23 65	0850	-	-	170	-	30	20.0	10.0	-	-	-
07 27 65	0950	-	-	126	-	24	18.0	6.0	-	-	-
07 29 65	0835	-	-	250	-	44	28.0	16.0	-	-	-
08 02 65	0845	-	-	130	-	-	-	-	-	-	-
	0950	-	-	120	-	-	-	-	-	-	-
08 03 65	1145	-	-	170	-	-	-	-	-	-	-
08 04 65	1145	-	-	99	-	-	-	-	-	-	-
08 05 65	1135	-	-	300	-	-	-	-	-	-	-
08 06 65	1120	-	-	160	-	-	-	-	-	-	-

RETRIEVAL DATE: 01/04/66

274830
TALLAHALA CR BELOW MASONITE O-F
MISSISSIPPI
SOUTHEAST
PASCAGOULA
AGENCY: 603200 TYPE: 006

DATE FROM TO	TIME OF DAY	00003 VSAMPLOC DEPTH FEET	00070 TURB JKSN JU	00095 CNDUCTVY AT 25C MICROMHO	00340 COD HI LEVEL MG/L	00900 TOT HARD CACO3 MG/L	00910 CALCIUM CACO3 MG/L	00920 MGNSIUM CACO3 MG/L	01045 IRON TOTAL UG/L	01055 MANGNESE MN UG/L	31677 STPCOCCI AD-EVA BR-100ML
02 23 65	1155	-	-	-	-	24	16.0	8.0	-	-	-
02 25 65	1036	-	-	-	-	32	24.0	8.0	-	-	-
02 26 65	0935	-	-	-	-	22	18.0	4.0	-	-	-
03 01 65	1040	-	-	-	-	26	22.0	4.0	-	-	-
03 02 65	1004	-	-	-	-	24	18.0	6.0	-	-	-
03 03 65	0940	-	-	-	-	36	18.0	18.0	-	-	-
03 04 65	1158	-	-	-	-	32	18.0	14.0	-	-	-
03 05 65	1111	-	-	-	-	28	18.0	10.0	-	-	-
03 08 65	1136	-	-	-	-	42	30.0	12.0	-	-	-
03 09 65	1112	-	-	-	-	34	22.0	12.0	-	-	-
03 10 65	1004	-	-	-	-	34	24.0	10.0	-	-	-
03 11 65	1046	-	-	-	-	36	24.0	12.0	-	-	-
03 12 65	1118	-	-	-	-	-	38.0	22.0	-	-	-
03 15 65	1057	-	-	-	-	34	22.0	12.0	-	-	-
03 19 65	1014	-	-	-	-	36	24.0	12.0	-	-	-
03 22 65	1148	-	-	-	-	36	26.0	10.0	-	-	16000.0
03 26 65	1200	-	-	-	-	42	30.0	12.0	-	-	54200.0
06 03 65	0955	-	-	500	-	-	40.0	-	-	-	-
06 07 65	1100	-	-	600	-	-	32.0	-	-	-	-
06 09 65	1045	-	-	400	-	-	36.0	-	-	-	-
06 11 65	1045	-	-	520	-	-	60.0	-	-	-	-
06 15 65	1040	-	-	400	-	-	34.0	-	-	-	-
07 19 65	1010	-	-	270	-	46	26.0	20.0	-	-	-
07 21 65	1025	-	-	250	-	30	19.0	11.0	-	-	-
07 23 65	1025	-	-	-	-	30	20.0	10.0	-	-	-
07 27 65	1015	-	-	80	-	22	14.0	8.0	-	-	-
07 29 65	1010	-	-	250	-	52	26.0	26.0	-	-	-
08 03 65	1200	-	-	50	-	-	-	-	-	-	-
08 04 65	1200	-	-	180	-	-	-	-	-	-	-
08 05 65	1200	-	-	290	-	-	-	-	-	-	-
08 06 65	1205	-	-	230	-	-	-	-	-	-	-

RETRIEVAL DATE: 01/04/66

274830
TALLAHALA CR BELOW MASONITE O-F
MISSISSIPPI
SOUTHEAST
PASCAGOULA
AGENCY: 603200 TYPE: 006

DATE FROM TO	TIME OF DAY	00010 WATER TEMP CENT	00060 STREAM FLOW CUFT/SEC	00300 DO MG/L	00301 DO SATUR PERCENT	00310 BOD 5 DAY MG/L	00400 PH S U	00410 T ALK CACO3 MG/L	00940 CHLORIDE CL MG/L	31505 COLIFORM MPN CONF /100ML	31615 FEC COLI EC 44.5 T./100ML
02 23 65	1155	11.0	1400	7.8	70.0	-	6.60	-	319	22100	3300
02 25 65	1036	10.0	530	6.2	55.0	-	6.70	-	32	92000	24000
02 26 65	0935	10.0	670	7.8	69.0	-	4.50	-	6	54200	24000
03 01 65	1040	12.0	560	6.8	63.0	-	4.80	-	21	160000L	10900
03 02 65	1004	14.0	920	6.3	61.0	-	4.20	-	20	54200	13000
03 03 65	0940	14.0	1120	8.3	80.0	234.0	4.50	-	7	-	-
03 04 65	1158	14.0	1140	6.5	63.0	134.0	4.40	-	15	13000	3480
03 05 65	1111	12.0	1200	7.5	69.0	64.0	4.60	-	7	54200	22100
03 08 65	1136	11.0	350	5.5	50.0	280.0	3.80	-	27	160000L	34800
03 09 65	1112	11.0	260	6.7	61.0	245.0	6.00	-	30	160000L	160000
03 10 65	1004	11.0	230	-	-	180.0	6.20	-	29	160000L	54200
03 11 65	1046	11.0	300	5.1	46.0	252.0	6.30	-	30	920000	109000
03 12 65	1118	12.0	580	8.1	75.0	66.0	6.40	-	33	330000	33000
03 15 65	1057	12.0	1010	6.4	59.0	344.0	4.40	-	15	23000	23000
03 19 65	1014	15.5	920	5.7	57.0	233.0	6.30	-	25	-	-
03 22 65	1148	12.0	-	5.0	46.0	310.0	4.70	-	21	920000	-
03 26 65	1200	16.0	-	3.2	32.0	440.0	5.10	-	32	160000L	27800
06 03 65	0955	28.0	26	0.0	0.0	-	6.90	-	102	16000000	5420000
06 07 65	1100	28.0	24	0.0	0.0	-	9.10	-	80	13000000	2200000
06 09 65	1045	29.0	24	0.0	0.0	150.0	6.70	-	77	17200000	7900000
06 11 65	1045	28.0	25	0.0	0.0	168.0	4.80	-	61	3100000	500000
06 15 65	1040	26.0	31	0.0	0.0	-	6.60	-	70	16000000	9200000
07 19 65	1010	30.0	31	0.0	0.0	300.0	6.30	-	57	16000000L	9200000
07 21 65	1025	26.0	32	0.0	0.0	108.0	6.60	-	37	17200000	3300000
07 23 65	1025	30.0	26	0.0	0.0	41.4L	6.80	-	40	99990000L	99990000L
07 27 65	1015	26.0	77	0.2	2.0	30.0	6.00	-	7	-	-
07 29 65	1010	28.0	59	0.0	0.0	63.0	6.50	-	15	3480000	3480000
08 02 65	0950	26.0	86	0.9	11.0	-	6.50	-	-	5420000	1300000
08 03 65	1200	28.0	61	0.0	0.0	40.8	6.50	-	30	7600	490
08 04 65	1200	27.0	52	0.3	4.0	-	6.50	-	27	99990000L	22100000
08 05 65	1200	28.0	45	0.0	0.0	-	5.60	-	33	11000000	3300000
08 06 65	1205	28.0	-	0.0	0.0	111.0	6.60	-	37	9200000	5420000

RETRIEVAL DATE: 01/04/66

274795
TALLAHALA CR BELOW TALLAHOMA CR
MISSISSIPPI
SOUTHEAST
PASCAGOULA
AGENCY: 603200 TYPE: 002

DATE FROM TO	TIME OF DAY	00010 WATER TEMP CENT	00060 STREAM FLOW CUFT/SEC	00300 DO MG/L	00301 DO SATUR PERCENT	00310 BOD 5 DAY MG/L	00400 PH S U	00410 T ALK CACO3 MG/L	00940 CHLORIDE CL MG/L	31505 COLIFORM MPN CONF /100ML	31615 FEC COLI EC 44.5 T./100ML
02 23 65	1352	12.0	3000	7.9	73.0	-	6.50	-	1172	22100	4900
02 25 65	1145	10.0	2300	6.7	59.0	-	4.70	-	11	5000	3300
02 26 65	1115	10.0	2400	7.7	68.0	-	5.10	-	15	92000	7000
03 01 65	1239	12.0	2150	6.6	61.0	-	5.80	-	11	92000	17200
03 02 65	1029	15.0	2800	5.5	54.0	63.5	4.70	-	12	54200	24000
03 03 65	1120	14.0	3000	5.7	55.0	148.0	5.00	-	1	54200	9400
03 04 65	1225	14.0	2900	7.0	68.0	52.0	5.80	-	12	92000	4900
03 05 65	1143	12.0	2900	7.3	67.0	10.0	5.90	-	7	24000	13000
03 08 65	1204	12.0	1900	5.9	54.0	157.0	4.80	-	40	54200	4900
03 09 65	1139	12.0	1500	5.8	54.0	72.0	6.30	-	17	160000L	160000L
03 10 65	1143	12.0	1640	6.7	62.0	84.0	6.30	-	19	160000	54200
03 11 65	1134	12.0	1540	4.7	43.0	142.0	-	-	15	1600000L	2000
03 12 65	1145	12.0	-	-	-	63.0	-	-	23	221000	11000
03 15 65	1147	14.0	2740	6.8	65.0	361.0	4.90	-	13	22000	8000
03 19 65	1203	16.0	2400	5.1	51.0	157.0	5.00	-	17	34800	7900
03 22 65	1204	12.0	1700	5.1	47.0	300.0	5.30	-	9	54200	241
03 26 65	1200	16.0	1360	2.7	27.0	446.0	6.10	-	24	160000	92000
06 03 65	1019	28.0	-	0.2	3.0	-	6.40	-	83	16000000L	16000000
06 07 65	1125	26.0	-	0.0	0.0	-	6.50	-	50	3300000	3300000
06 09 65	1110	27.0	-	0.0	0.0	126.0	6.80	-	21	2400000	490000
06 11 65	1110	26.0	-	0.0	0.0	72.0	6.60	-	41	3480000	1090000
06 15 65	1105	26.0	-	0.0	0.0	87.0	6.60	-	70	13000000	4900000
07 19 65	1037	30.0	-	0.0	0.0	17.7	6.80	-	41	9200000	5420000
07 21 65	1030	30.0	-	0.0	0.0	39.0	7.00	-	44	330000	170000
07 23 65	1040	29.0	-	0.0	0.0	37.2	6.90	-	30	-	-
07 27 65	1035	26.0	-	2.1	26.0	12.9	6.40	-	-	3480000	1720000
07 29 65	1035	28.0	-	3.4	43.0	16.2	6.50	-	5	3480000	790000

RETRIEVAL DATE: 01/04/66

274795
TALLAHALA CR BELOW TALLAHOMA CR
MISSISSIPPI
SOUTHEAST
PASCAGOULA
AGENCY: 603200 TYPE: 002

DATE FROM TO	TIME OF DAY	00003 VSAMPLOC DEPTH FEET	00070 TURB JKSN JU	00095 CNDUCTVY AT 25C MICROMHO	00340 COD HI LEVEL MG/L	00900 TOT HARD CACO3 MG/L	00910 CALCIUM CACO3 MG/L	00920 MGNSIUM CACO3 MG/L	01045 IRON TOTAL UG/L	01055 MANGNESE MN UG/L	31677 STPCOCCI AD-EVA BR-100ML
02 23 65	1352	-	-	-	-	26	14.0	12.0	-	-	-
02 25 65	1145	-	-	-	-	20	14.0	6.0	-	-	-
02 26 65	1115	-	-	-	-	16	14.0	2.0	-	-	-
03 01 65	1239	-	-	-	-	22	12.0	10.0	-	-	-
03 02 65	1029	-	-	-	-	20	12.0	8.0	-	-	-
03 03 65	1120	-	-	-	-	20	12.0	8.0	-	-	-
03 04 65	1225	-	-	-	-	20	14.0	6.0	-	-	-
03 05 65	1143	-	-	-	-	38	14.0	24.0	-	-	-
03 08 65	1204	-	-	-	-	32	20.0	12.0	-	-	-
03 09 65	1139	-	-	-	-	26	16.0	10.0	-	-	-
03 10 65	1143	-	-	-	-	20	18.0	2.0	-	-	-
03 11 65	1134	-	-	-	-	26	20.0	6.0	-	-	-
03 12 65	1145	-	-	-	-	30	18.0	12.0	-	-	-
03 15 65	1147	-	-	-	-	26	26.0	0.0	-	-	-
03 19 65	1203	-	-	-	-	24	14.0	10.0	-	-	-
03 22 65	1204	-	-	-	-	26	18.0	8.0	-	-	-
03 26 65	1200	-	-	-	-	36	22.0	14.0	-	-	-
06 03 65	1019	-	-	400	-	-	42.0	-	-	-	-
06 07 65	1125	-	-	290	-	-	30.0	-	-	-	-
06 09 65	1110	-	-	120	-	-	14.0	-	-	-	-
06 11 65	1110	-	-	270	-	-	48.0	-	-	-	-
06 15 65	1105	-	-	300	-	-	34.0	-	-	-	-
07 19 65	1037	-	-	220	-	34	18.0	16.0	-	-	-
07 21 65	1030	-	-	310	-	44	20.0	24.0	-	-	-
07 23 65	1040	-	-	-	-	28	19.0	9.0	-	-	-
07 29 65	1035	-	-	90	-	20	14.0	6.0	-	-	-

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RETRIEVAL DATE: 01/04/66

274750
TALLAHALA CR COUNTY RD S OF ELLI
MISSISSIPPI
SOUTHEAST
PASCAGOULA
AGENCY: 603200 TYPE: 002

DATE FROM TO	TIME OF DAY	00010 WATER TEMP CENT	00060 STREAM FLOW CUFT/SEC	00300 DO MG/L	00301 DO SATUR PERCENT	00310 BOD 5 DAY MG/L	00400 PH S U	00410 T ALK CACO3 MG/L	00940 CHLORIDE CL MG/L	31505 COLIFORM MPN CONF /100ML	31615 FEC COLI EC 44.5 T./100ML
02 24 65	0930	12.0	2130	6.1	56.0	-	6.30	-	16	54000	13000
02 25 65	1215	10.0	1850	5.8	51.0	-	5.60	-	9	-	-
02 26 65	1145	10.0	1726	6.2	54.0	-	5.30	-	15	17200	3300
03 01 65	1315	12.0	1820	6.6	60.0	-	6.00	-	9	54200	7000
03 02 65	1100	15.0	2700	5.3	52.0	41.0	5.70	-	10	160000	17200
03 03 65	1147	14.0	2400L	4.1	39.0	93.0	5.60	-	1	34800	34800
03 04 65	1251	14.0	-	5.4	52.0	39.0	6.00	-	6	24000	7900
03 05 65	1210	13.0	-	5.2	49.0	47.0	5.60	-	7	160000	4900
03 08 65	1233	12.0	1480	5.7	52.0	78.0	5.60	-	34	24000	4900
03 09 65	1022	-	1856	-	-	-	-	-	-	-	-
	1205	12.0	994	3.8	35.0	109.0	5.70	-	15	54200	2700
03 10 65	1207	12.0	876	-	-	93.0	6.30	-	19	92000	4900
03 11 65	1158	12.0	840	3.5	32.0	65.0	6.30	-	11	160000	34800
03 12 65	1206	12.0	1180	-	-	-	-	-	-	-	-
03 15 65	1212	14.0	-	4.6	44.0	330.0	5.70	-	13	54200	7900
03 19 65	1200	16.0	1860	2.9	29.0	-	5.20	-	-	160000	17200
03 22 65	1242	12.0	1295	4.5	41.0	247.0	5.80	-	8	34800	60
03 26 65	1300	16.0	784	0.3	3.0	216.0	6.20	-	17	160000L	13000
06 03 65	1049	27.0	-	0.0	0.0	-	7.50	-	42	1300000	230000
06 07 65	1205	25.0	-	0.1	1.0	18.6	6.70	-	51	330000	70000
06 09 65	1142	28.0	-	0.0	0.0	63.0	7.20	-	53	5000	2000
06 11 65	1138	26.0	-	1.4	17.0	18.0	6.60	-	13	160000L	160000L
06 15 65	1125	25.0	-	0.0	0.0	30.0	6.80	-	30	70000	13000
07 19 65	1055	30.0	-	2.2	29.0	7.7	7.00	-	52	330	170
07 21 65	1055	29.0	-	3.1	40.0	4.5	7.00	-	50	16000	1720
07 23 65	1010	28.0	-	2.7	34.0	4.8	7.20	-	37	1700	1300
07 27 65	1115	28.0	348	2.5	32.0	14.4	7.30	-	21	160000L	160000L
07 29 65	1105	27.0	250	3.3	41.0	6.0	6.50	-	5	20000	11000

RETRIEVAL DATE: 01/04/66

274750
TALLAHALA CR COUNTY RD S OF ELLI
MISSISSIPPI
SOUTHEAST
PASCAGOULA
AGENCY: 603200 TYPE: 002

DATE FROM TO	TIME OF DAY	00003 VSAMPLOC DEPTH FEET	00070 TURB JKSN JU	00095 CNDUCTVY AT 25C MICROMHO	00340 COD HI LEVEL MG/L	00900 TOT HARD CACO3 MG/L	00910 CALCIUM CACO3 MG/L	00920 MGNSIUM CACO3 MG/L	01045 IRON TOTAL UG/L	01055 MANGNESE MN UG/L	31677 STPCOCCI AD-EVA BR-100ML
02 24 65	0930	-	-	-	-	20	12.0	8.0	-	-	-
02 25 65	1215	-	-	-	-	18	12.0	6.0	-	-	-
02 26 65	1145	-	-	-	-	20	12.0	8.0	-	-	-
03 01 65	1315	-	-	-	-	18	10.0	8.0	-	-	-
03 02 65	1100	-	-	-	-	14	10.0	4.0	-	-	-
03 03 65	1147	-	-	-	-	16	12.0	4.0	-	-	-
03 04 65	1251	-	-	-	-	18	12.0	6.0	-	-	-
03 05 65	1210	-	-	-	-	28	18.0	10.0	-	-	-
03 08 65	1233	-	-	-	-	22	18.0	4.0	-	-	-
03 09 65	1205	-	-	-	-	34	20.0	14.0	-	-	-
03 10 65	1207	-	-	-	-	28	16.0	12.0	-	-	-
03 11 65	1158	-	-	-	-	30	16.0	14.0	-	-	-
03 15 65	1212	-	-	-	-	24	16.0	8.0	-	-	-
03 19 65	1200	-	-	-	-	-	-	-	-	-	-
03 22 65	1242	-	-	-	-	26	18.0	8.0	-	-	175.0
03 26 65	1300	-	-	-	-	30	24.0	6.0	-	-	-
06 03 65	1049	-	-	250	-	-	26.0	-	-	-	542.0
06 07 65	1205	-	-	230	-	-	26.0	-	-	-	-
06 09 65	1142	-	-	250	-	-	20.0	-	-	-	-
06 11 65	1138	-	-	115	-	-	14.0	-	-	-	-
06 15 65	1125	-	-	125	-	-	12.0	-	-	-	-
07 19 65	1055	-	-	210	-	30	20.0	10.0	-	-	-
07 21 65	1055	-	-	230	-	32	14.0	18.0	-	-	-
07 23 65	1010	-	-	-	-	26	18.0	8.0	-	-	-
07 27 65	1115	-	-	190	-	34	18.0	16.0	-	-	-
07 29 65	1105	-	-	58	-	18	10.0	8.0	-	-	-

RETRIEVAL DATE: 01/04/66

274740
TALLAHALLA CR E MORRISTON COU RD
MISSISSIPPI
SOUTHEAST
PASCAGOULA
AGENCY: 603200 TYPE: 002

DATE FROM TO	TIME OF DAY	00010 WATER TEMP CENT	00060 STREAM FLOW CUFT/SEC	00300 DO MG/L	00301 DO SATUR PERCENT	00310 BOD 5 DAY MG/L	00400 PH S U	00410 T ALK CACO3 MG/L	00940 CHLORIDE CL MG/L	31505 COLIFORM MPN CONF /100ML	31615 FEC COLI EC 44.5 T./100ML
02 24 65	1002	12.0	-	6.7	61.0	6.1	6.00	-	65	34800	2200
02 25 65	0943	10.0	-	6.1	53.0	-	6.20	-	6	24000	8000
02 26 65	0900	9.0	-	5.9	50.0	-	5.90	-	10	35000	8000
03 01 65	0940	11.0	-	6.3	56.0	-	6.20	-	10	17200	1090
03 02 65	0915	14.0	-	5.3	51.0	46.5	6.00	-	18	92000	24000
03 03 65	0915	13.0	-	3.6	33.0	71.0	5.70	-	5	34800	13000
03 04 65	0910	12.0	-	5.3	48.0	55.0	5.80	-	3	34800	13000
03 05 65	0920	11.0	-	4.9	44.0	48.0	5.70	-	7	7900	1720
03 08 65	0924	10.0	-	6.3	55.0	95.0	5.50	-	16	54200	7000
03 09 65	0917	10.0	-	5.2	45.0	94.0	5.70	-	12	4900	1300
03 10 65	0920	10.0	-	4.3	37.0	65.6	5.40	-	10	160000	4900
03 11 65	0923	11.0	-	4.4	39.0	59.7	6.00	-	10	160000	22100
03 12 65	0915	13.0	-	2.6	24.0	141.0	6.30	-	21	160000L	34800
03 15 65	0920	13.0	-	5.1	48.0	271.0	5.30	-	10	34800	3300
03 19 65	0915	15.0	-	2.8	27.0	225.0	5.10	-	50	92000	14100
03 22 65	0922	12.0	-	4.5	41.0	135.0	6.40	-	5	4900	-
03 26 65	0932	17.0	-	0.0	0.0	2220.0	6.50	-	126	160000L	7900
06 03 65	1103	27.0	-	0.0	0.0	19.8	7.10	-	32	230000	230000
06 07 65	1231	25.0	-	0.5	6.0	15.0	6.60	-	37	94000	33000
06 09 65	1210	26.0	-	0.7	9.0	75.0	7.00	-	43	17000	5000
06 11 65	1146	26.0	-	0.7	8.5	24.0	7.00	-	24	17500	10900
06 15 65	1143	26.0	-	1.8	22.0	36.0	6.70	-	30	33000	2000K
07 19 65	1115	29.0	-	0.3	4.0	84.0	7.70	-	46	240000	79000
07 21 65	1120	29.0	-	2.9	37.0	5.7	7.00	-	48	8000	2000K
07 23 65	1120	29.0	-	3.7	47.0	3.6	6.60	-	30	5000	2000
07 27 65	1135	29.0	-	1.6	20.0	5.4	7.00	-	-	7000	3300
07 29 65	1130	28.0	-	3.0	38.0	2.4	6.50	-	5	7900	3300

RETRIEVAL DATE: 01/04/66

274740
TALLAHALLA CR E MORRISTON COU RD
MISSISSIPPI
SOUTHEAST
PASCAGOULA
AGENCY: 603200 TYPE: 002

DATE FROM TO	TIME OF DAY	00003 VSAMPLOC DEPTH FEET	00070 TURB JKSN JU	00095 CNDUCTVY AT 25C MICROMHO	00340 COD HI LEVEL MG/L	00900 TOT HARD CACO3 MG/L	00910 CALCIUM CACO3 MG/L	00920 MGNSIUM CACO3 MG/L	01045 IRON TOTAL UG/L	01055 MANGNESE MN UG/L	31677 STPCOCCI AD-EVA BR-100ML
02 24 65	1002	-	-	-	-	22	16.0	6.0	-	-	-
02 25 65	0943	-	-	-	-	18	8.0	10.0	-	-	-
02 26 65	0900	-	-	-	-	20	12.0	8.0	-	-	-
03 01 65	0940	-	-	-	-	18	16.0	2.0	-	-	-
03 02 65	0915	-	-	-	-	12	12.0	0.0	-	-	-
03 03 65	0915	-	-	-	-	20	10.0	10.0	-	-	-
03 04 65	0910	-	-	-	-	18	12.0	6.0	-	-	-
03 05 65	0920	-	-	-	-	22	14.0	8.0	-	-	-
03 08 65	0924	-	-	-	-	44	20.0	24.0	-	-	-
03 09 65	0917	-	-	-	-	26	16.0	10.0	-	-	-
03 10 65	0920	-	-	-	-	24	16.0	8.0	-	-	-
03 11 65	0923	-	-	-	-	24	18.0	6.0	-	-	-
03 12 65	0915	-	-	-	-	28	16.0	12.0	-	-	-
03 15 65	0920	-	-	-	-	26	12.0	14.0	-	-	-
03 19 65	0915	-	-	-	-	48	14.0	34.0	-	-	-
03 22 65	0922	-	-	-	-	20	14.0	6.0	-	-	-
03 26 65	0932	-	-	-	-	62	20.0	42.0	-	-	-
06 03 65	1103	-	-	210	-	22	22.0	0.0	-	-	-
06 07 65	1231	-	-	170	-	-	20.0	-	-	-	-
06 09 65	1210	-	-	200	-	-	16.0	-	-	-	-
06 11 65	1146	-	-	150	-	-	16.0	-	-	-	-
06 15 65	1143	-	-	120	-	-	18.0	-	-	-	-
07 19 65	1115	-	-	240	-	54	20.0	34.0	-	-	-
07 21 65	1120	-	-	220	-	30	12.0	18.0	-	-	-
07 23 65	1120	-	-	-	-	22	13.0	9.0	-	-	-
07 29 65	1130	-	-	56	-	15	12.0	3.0	-	-	-

RETRIEVAL DATE: 01/04/66

274730
TALLAHALA CR S RUNNELSTOWN
MISSISSIPPI
SOUTHEAST
PASCAGOULA
AGENCY: 603200 TYPE: 006

DATE FROM TO	TIME OF DAY	00010 WATER TEMP CENT	00060 STREAM FLOW CUFT/SEC	00300 DO MG/L	00301 DO SATUR PERCENT	00310 BOD 5 DAY MG/L	00400 PH S U	00410 T ALK CACO3 MG/L	00940 CHLORIDE CL MG/L	31505 COLIFORM MPN CONF /100ML	31615 FEC COLI EC 44.5 T./100ML
02 24 65	1046	12.0	2726	7.2	66.0	5.9	6.10	-	56	92000	6300
02 25 65	0943	9.0	2238	6.7	57.0	-	5.80	-	35	54000	8000
02 26 65	0932	9.0	1960	6.4	55.0	-	5.30	-	11	54000	1700
03 01 65	1015	11.0	1470	6.9	62.0	5.9	6.10	-	10	54200	4900
03 02 65	0955	14.0	3210	-	-	-	-	-	-	92000	24000
03 03 65	0950	13.0	3012	4.1	38.0	60.0	5.80	-	5	54200	4900
03 04 65	0935	12.0	2682	4.9	45.0	57.0	5.80	-	3	34800	4600
03 05 65	0950	11.0	2442	5.7	51.0	31.0	6.10	-	6	54200	2780
03 08 65	0955	9.0	1870	6.8	58.0	53.0	6.10	-	15	54200	13000
03 09 65	0948	11.0	1158	5.7	51.0	50.5	6.10	-	12	54200	330
03 10 65	0955	11.0	871	4.0	36.0	84.7	5.70	-	7	17200	4900
03 11 65	0953	11.0	824	4.2	37.0	60.9	6.20	-	8	24000	7900
03 12 65	0948	13.0	927	3.9	36.0	117.0	6.20	-	34	160000L	7000
03 15 65	0948	13.0	2085	4.6	43.0	97.0	5.40	-	11	24000	2700
03 19 65	0950	14.0	2285	3.5	33.0	181.0	6.30	-	12	54200	24000
03 22 65	0953	12.0	1478	4.7	43.0	175.0	6.00	-	6	23000	-
03 26 65	0955	17.0	724	0.1	1.0	2220.0	6.20	-	14	24000	1300
04 01 65		-	-	-	-	-	-	-	-	160000L	3300
06 03 65	1136	27.0	91	3.4	42.0	8.8	7.20	-	21	11000	5000
06 07 65	1300	24.0	165	0.6	7.0	25.2	6.60	-	30	27800	3300
06 09 65	1236	27.0	-	2.4	29.0	63.0	7.00	-	30	4000	2000K
06 11 65	1215	26.0	162	1.8	22.0	18.0	7.00	-	41	230	230
06 15 65	1220	26.0	165	2.4	29.0	39.0	6.50	-	10	1090	170
07 19 65	1148	30.0	102	0.0	0.0	21.0	6.90	-	20	160000	34800
07 21 65	1145	30.0	78	2.9	38.0	3.3	7.00	-	33	17000	2000K
07 23 65	1150	29.0	78	5.4	71.0	3.2	6.70	-	36	3480000	14100
07 27 65	1155	29.0	-	7.0	90.0	4.2	7.00	-	20	50000	2000
07 29 65	1140	27.0	306	2.9	36.0	4.5	6.40	-	10	34800	4900

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RETRIEVAL DATE: 01/04/66

274730
TALLAHALA CR S RUNNELSTOWN
MISSISSIPPI
SOUTHEAST
PASCAGOULA
AGENCY: 603200 TYPE: 006

DATE FROM TO	TIME OF DAY	00003 VSAMPLOC DEPTH FEET	00070 TURB JKSN JU	00095 CNDUCTVY AT 25C MICROMHO	00340 COD HI LEVEL MG/L	00900 TOT HARD CACO3 MG/L	00910 CALCIUM CACO3 MG/L	00920 MGNSIUM CACO3 MG/L	01045 IRON TOTAL UG/L	01055 MANGNESE MN UG/L	31677 STPCOCCI AD-EVA BR-100ML
02 24 65	1046	-	-	-	-	20	12.0	8.0	-	-	-
02 25 65	0943	-	-	-	-	18	10.0	8.0	-	-	-
02 26 65	0932	-	-	-	-	18	14.0	4.0	-	-	-
03 01 65	1015	-	-	-	-	18	12.0	6.0	-	-	-
03 03 65	0950	-	-	-	-	22	10.0	12.0	-	-	-
03 04 65	0935	-	-	-	-	18	12.0	6.0	-	-	-
03 05 65	0950	-	-	-	-	20	12.0	8.0	-	-	-
03 08 65	0955	-	-	-	-	28	18.0	10.0	-	-	-
03 09 65	0948	-	-	-	-	24	12.0	12.0	-	-	-
03 10 65	0955	-	-	-	-	24	18.0	6.0	-	-	-
03 11 65	0953	-	-	-	-	24	14.0	10.0	-	-	-
03 12 65	0948	-	-	-	-	26	14.0	12.0	-	-	-
03 15 65	0948	-	-	-	-	24	14.0	10.0	-	-	-
03 19 65	0950	-	-	-	-	20	12.0	8.0	-	-	-
03 22 65	0953	-	-	-	-	20	14.0	6.0	-	-	-
03 26 65	0955	-	-	-	-	30	17.0	13.0	-	-	-
04 01 65		-	-	-	-	-	-	-	-	-	340.0
06 03 65	1136	-	-	150	-	26	14.0	12.0	-	-	-
06 07 65	1300	-	-	170	-	-	20.0	-	-	-	-
06 09 65	1236	-	-	160	-	-	14.0	-	-	-	-
06 11 65	1215	-	-	150	-	-	16.0	-	-	-	-
06 15 65	1220	-	-	70	-	-	28.0	-	-	-	-
07 19 65	1148	-	-	155	-	30	16.0	14.0	-	-	-
07 21 65	1145	-	-	210	-	24	16.0	8.0	-	-	-
07 23 65	1150	-	-	-	-	20	12.0	8.0	-	-	-
07 27 65	1155	-	-	110	-	18	12.0	6.0	-	-	-
07 29 65	1140	-	-	79	-	16	10.0	6.0	-	-	-

RETRIEVAL DATE: 01/04/66

274702
TALLAHALLA CR ABOVEMOUTH LEAF
MISSISSIPPI
SOUTHEAST
PASCAGOULA
AGENCY: 603200 TYPE: 002

DATE FROM TO	TIME OF DAY	00010 WATER TEMP CENT	00060 STREAM FLOW CUFT/SEC	00300 DO MG/L	00301 DO SATUR PERCENT	00310 BOD 5 DAY MG/L	00400 PH S U	00410 T ALK CACO3 MG/L	00940 CHLORIDE CL MG/L	31505 COLIFORM MPN CONF /100ML	31615 FEC COLI EC 44.5 T./100ML
02 24 65	1128	12.0	3550	7.6	70.0	6.6	6.20	-	31	24000	2300
02 25 65	1023	10.0	-	7.2	63.0	-	5.90	-	5	24000	13000
02 26 65	1020	9.0	3500	6.6	56.0	-	5.70	-	9	34800	4900
03 01 65	1050	12.0	-	7.5	69.0	-	5.80	-	30	54200	17200
03 02 65	1030	14.0	5100	7.7	74.0	34.0	5.90	-	18	92000	9400
03 03 65	1028	13.0	5800	4.9	46.0	49.0	5.90	-	3	160000	4600
03 04 65	1012	12.0	5400	5.1	47.0	50.0	5.90	-	3	34800	2300
03 05 65	1023	11.0	4560	6.1	55.0	31.0	6.10	-	7	-	-
03 08 65	1025	9.0	2550	7.5	64.0	45.0	5.90	-	13	34800	13000
03 09 65	1022	11.0	-	6.9	62.0	32.0	6.20	-	12	7900	790
03 10 65	1030	11.0	1545	5.4	48.0	64.5	6.00	-	8	10900	120
03 11 65	1030	12.0	1444	5.3	48.0	61.7	6.40	-	7	160000	7900
03 12 65	1028	13.0	3900	4.9	46.0	66.0	6.20	-	18	160000	10900
03 15 65	1028	13.0	3900	4.4	41.0	236.0	5.30	-	9	348000	49000
03 19 65	1023	15.0	2460	3.9	38.0	164.0	6.20	-	9	240000	23000
03 22 65	1028	13.0	-	5.2	49.0	397.0	6.10	-	7	33000	5420
03 26 65	1025	17.0	1284	1.4	14.0	2160.0	6.30	-	10	34800	1100
04 01 65		-	-	-	-	-	-	-	-	160000L	940
06 03 65	1200	28.0	-	6.7	85.0	3.1	7.40	-	17	17500	500
06 04 65	1325	24.0	-	6.7	79.0	1.3	7.20	-	17	4900	80
06 07 65	1305	28.0	-	6.3	80.0	3.0	6.70	-	20	34800	200K
06 08 65	1145	25.0	-	4.8	57.0	6.4	7.10	-	22	1200	70
06 09 65	1305	28.0	-	5.8	73.0	-	7.20	-	24	109000	5000
06 10 65	1130	27.0	-	4.8	60.0	1.9	6.80	-	30	7900	140
06 11 65	1240	27.0	-	5.6	69.0	5.5	6.90	-	34	310000	17000
06 14 65	1130	29.0	-	5.2	67.0	5.8	6.80	-	24	490	80
06 15 65	1243	27.0	-	3.7	46.0	27.0	6.70	-	20	2000K	2000K
06 16 65	1120	25.0	-	7.6	90.0	2.9	6.40	-	20	3450	210
07 19 65	1200	31.0	135	6.6	88.0	3.0	7.00	-	15	7000	220
07 20 65	1110	30.0	-	4.2	55.0	3.6	7.30	-	43	9400	400
07 21 65	1200	30.0	106	3.8	50.0	4.2	7.00	-	39	4600	230
07 22 65	1150	30.0	-	5.7	75.0	2.7	-	-	-	4600	3100
07 23 65	1215	29.0	101	7.4	95.0	2.1	6.80	-	21	10900	110
07 26 65	1100	30.0	98	8.7	114.0	5.3	7.10	-	24	24000	-
07 27 65	1215	29.0	168	8.6	110.0	6.5	7.30	-	20	54200	500
07 28 65	1145	30.0	533	6.6	87.0	3.7	6.70	-	19	160000	7900
07 29 65	1210	27.0	356	2.3	28.0	12.0	7.00	-	14	23000	13000
07 30 65	1050	27.0	332	5.7	71.0	4.1	6.40	-	8	-	-
08 02 65	1100	29.0	300	5.7	73.0	1.6	6.60	-	60	16000	1091

RETRIEVAL DATE: 01/04/66

274702
TALLAHALLA CR ABOVEMOUTH LEAF
MISSISSIPPI
SOUTHEAST
PASCAGOULA
AGENCY: 603200 TYPE: 002

DATE FROM TO	TIME OF DAY	00010 WATER TEMP CENT	00060 STREAM FLOW CUFT/SEC	00300 DO MG/L	00301 DO SATUR PERCENT	00310 BOD 5 DAY MG/L	00400 PH S U	00410 T ALK CACO3 MG/L	00940 CHLORIDE CL MG/L	31505 COLIFORM MPN CONF /100ML	31615 FEC COLI EC 44.5 T./100ML
08 03 65	1310	30.0	235	6.9	91.0	3.1	6.70	-	21	13000	40
08 04 65	1320	27.0	177	6.6	82.0	2.7	6.50	-	11	3300	170
08 05 65	1405	29.0	146	4.6	59.0	2.9	6.40	-	11	2300	200K
08 06 65	1345	28.0	128	7.1	90.0	2.3	6.00	-	11	11700	3300
08 09 65	1130	29.0	253	7.5	96.0	3.3	6.10	-	19	92000	700
08 10 65	1115	28.0	538	5.6	71.0	3.9	6.30	-	20	92000	24000
08 11 65	1100	27.0	391	2.2	27.0	1.0	6.60	-	17	542000	172000
08 12 65	1105	27.0	391	5.3	65.0	2.4	5.50	-	12	141000	63000
08 13 65	1115	28.0	314	4.6	58.0	3.5	7.00	-	17	24000	7900

RETRIEVAL DATE: 01/04/66

274702
TALLAHALLA CR ABOVEMOUTH LEAF
MISSISSIPPI
SOUTHEAST
PASCAGOULA
AGENCY: 603200 TYPE: 002

DATE FROM TO	TIME OF DAY	00003 VSAMPLOC DEPTH FEET	00070 TURB JKSN JU	00095 CNDUCTVY AT 25C MICROMHO	00340 COD HI LEVEL MG/L	00900 TOT HARD CACO3 MG/L	00910 CALCIUM CACO3 MG/L	00920 MGNSIUM CACO3 MG/L	01045 IRON TOTAL UG/L	01055 MANGNESE MN UG/L	31677 STPCOCCI AD-EVA BR-100ML
02 24 65	1128	-	-	-	-	18	10.0	80.0	-	-	-
02 25 65	1023	-	-	-	-	16	10.0	6.0	-	-	-
02 26 65	1020	-	-	-	-	20	12.0	8.0	-	-	-
03 01 65	1050	-	-	-	-	14	12.0	2.0	-	-	-
03 02 65	1030	-	-	-	-	12	8.0	4.0	-	-	-
03 03 65	1028	-	-	-	-	24	10.0	14.0	-	-	-
03 04 65	1012	-	-	-	-	14	8.0	6.0	-	-	-
03 05 65	1023	-	-	-	-	18	14.0	4.0	-	-	-
03 08 65	1025	-	-	-	-	30	18.0	12.0	-	-	-
03 09 65	1022	-	-	-	-	20	12.0	8.0	-	-	-
03 10 65	1030	-	-	-	-	20	14.0	6.0	-	-	-
03 11 65	1030	-	-	-	-	22	14.0	8.0	-	-	-
03 12 65	1028	-	-	-	-	24	16.0	8.0	-	-	-
03 15 65	1028	-	-	-	-	24	14.0	10.0	-	-	-
03 19 65	1023	-	-	-	-	20	10.0	10.0	-	-	920.0
03 22 65	1028	-	-	-	-	20	12.0	8.0	-	-	-
03 26 65	1025	-	-	-	-	26	18.0	8.0	-	-	200.0K
06 03 65	1200	-	-	110	-	18	12.0	6.0	-	-	-
06 04 65	1325	-	-	80	-	22	12.0	10.0	-	-	-
06 07 65	1305	-	-	120	-	22	14.0	8.0	-	-	-
06 08 65	1145	-	-	132	-	-	12.0	-	-	-	-
06 09 65	1305	-	-	140	-	-	14.0	-	-	-	-
06 10 65	1130	-	-	130	-	-	15.0	-	-	-	-
06 11 65	1240	-	-	215	-	-	14.0	-	-	-	-
06 14 65	1130	-	-	110	-	-	16.0	-	-	-	-
06 15 65	1243	-	-	80	-	-	14.0	-	-	-	-
06 16 65	1120	-	-	90	-	-	10.0	-	-	-	-
07 19 65	1200	-	-	110	-	18	10.0	8.0	-	-	-
07 20 65	1110	-	-	200	-	32	12.0	20.0	-	-	-
07 21 65	1200	-	-	210	-	30	17.0	13.0	-	-	-
07 23 65	1215	-	-	-	-	20	12.0	8.0	-	-	-
07 26 65	1100	-	-	130	-	18	8.0	10.0	-	-	-
07 27 65	1215	-	-	108	-	14	10.0	4.0	-	-	-
07 28 65	1145	-	-	83	-	17	10.0	7.0	-	-	-
07 29 65	1210	-	-	144	-	24	14.0	10.0	-	-	-
07 30 65	1050	-	-	59	-	14	8.0	6.0	-	-	-
08 02 65	1100	-	-	200	-	-	-	-	-	-	-
08 03 65	1310	-	-	70	-	-	-	-	-	-	-
08 04 65	1320	-	-	74	-	-	-	-	-	-	-

RETRIEVAL DATE: 01/04/66

274702
TALLAHALLA CR ABOVEMOUTH LEAF
MISSISSIPPI
SOUTHEAST
PASCAGOULA
AGENCY: 603200 TYPE: 002

DATE FROM TO	TIME OF DAY	00003 VSAMPLOC DEPTH FEET	00070 TURB JKSN JU	00095 CNDUCTVY AT 25C MICROMHO	00340 COD HI LEVEL MG/L	00900 TOT HARD CACO3 MG/L	00910 CALCIUM CACO3 MG/L	00920 MGNSIUM CACO3 MG/L	01045 IRON TOTAL UG/L	01055 MANGNESE MN UG/L	31677 STPCOCCI AD-EVA BR-100ML
08 05 65	1405	-	-	74	-	-	-	-	-	-	-
08 06 65	1345	-	-	70	-	-	-	-	-	-	-
08 09 65	1130	-	-	80	-	-	-	-	-	-	-
08 11 65	1100	-	-	124	-	-	-	-	-	-	-
08 12 65	1105	-	-	76	-	-	-	-	-	-	-
08 13 65	1115	-	-	112	-	-	-	-	-	-	-

RETRIEVAL DATE: 01/04/66

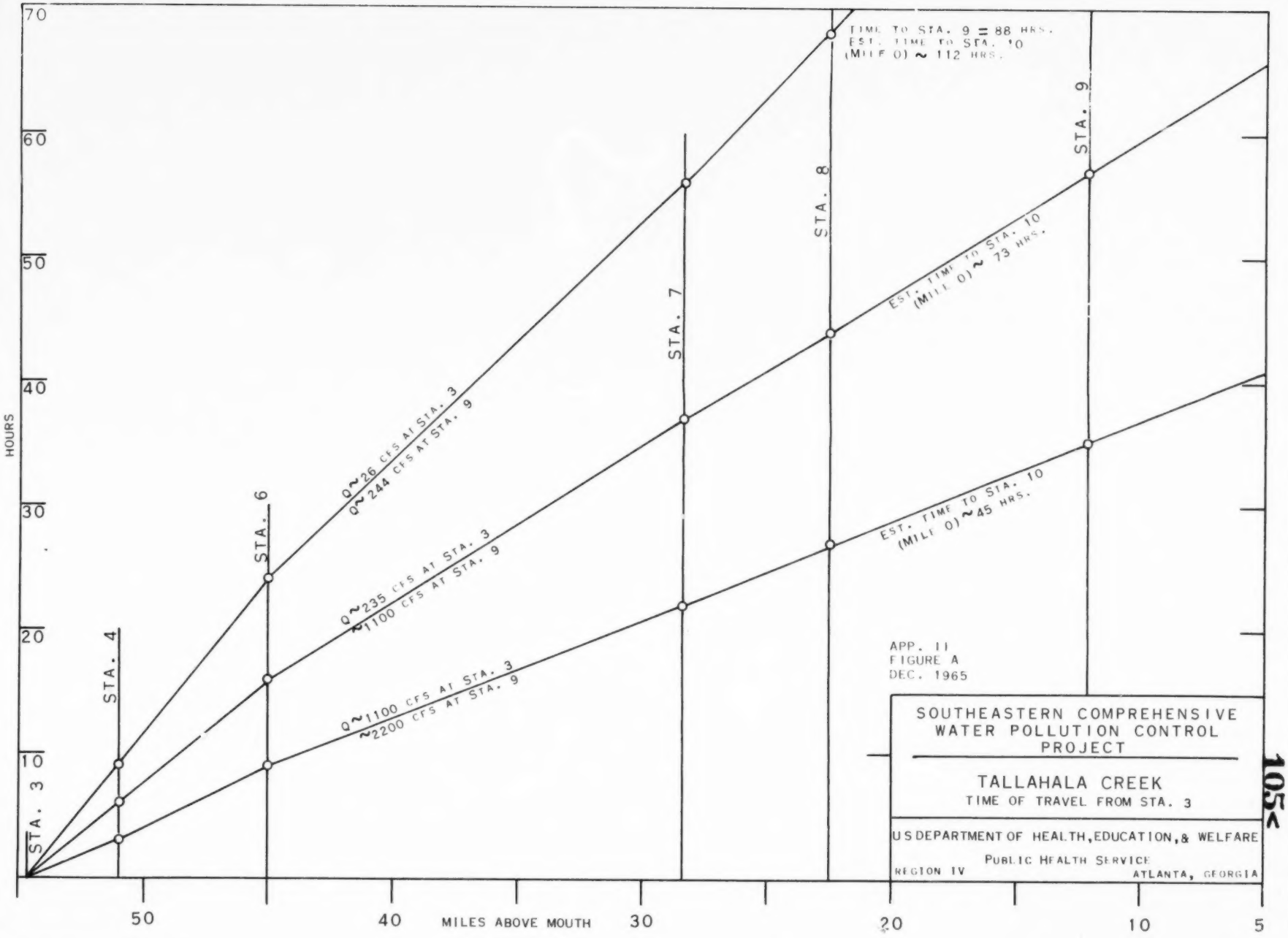
274940
TALLAHOMA CR 1 MI W LARUEL CO RD
MISSISSIPPI
SOUTHEAST
PASCAGOULA
AGENCY: 603200 TYPE: 002

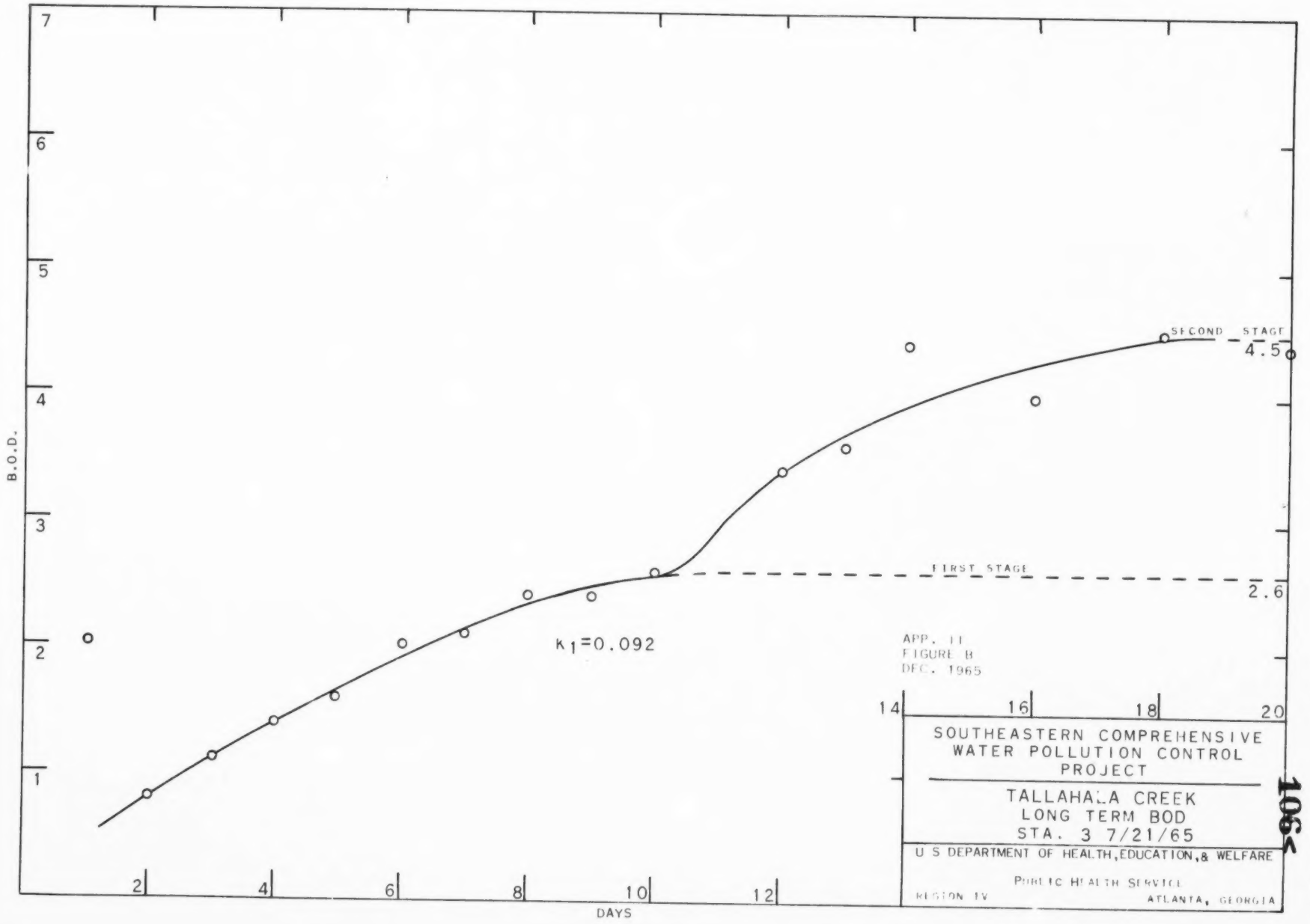
DATE FROM TO	TIME OF DAY	00010 WATER TEMP CENT	00060 STREAM FLOW CUFT/SEC	00300 DO MG/L	00301 DO SATUR PERCENT	00310 BOD 5 DAY MG/L	00400 PH S U	00410 T ALK CACO3 MG/L	00940 CHLORIDE CL MG/L	31505 COLIFORM MPN CONF /100ML	31615 FEC COLI EC 44.5 T./100ML
02 23 65	1229	11.0	1040	9.4	85.0	1.1	6.20	-	160	4600	230
02 25 65	1055	10.0	1360	9.8	87.0	2.9	6.10	-	6	17000	4600
02 26 65	1000	10.0	1380	9.8	87.0	2.8	6.00	-	3	17200	1300
03 01 65	1105	12.0	980	9.5	88.0	0.3	6.10	-	10	4260	760
03 02 65	0947	15.0	1730	9.0	89.0	1.9	6.10	-	10	34800	4600
03 03 65	1004	14.0	1800	8.7	84.0	18.0	6.10	-	0	17200	2300
03 04 65	1043	12.0	1800	9.6	89.0	0.6	6.10	-	4	7900	1410
03 05 65	1051	12.0	1740	9.8	90.0	1.7	6.40	-	1	10900	1100
03 08 65	1052	10.0	750	11.0	97.0	2.2	5.40	-	8	2300	140
03 09 65	1032	10.0	710	11.3	100.0	2.5	6.40	-	6	1090	310
03 10 65	1030	11.0	690	11.4	103.0	3.5	6.30	-	6	3300	330
03 11 65	1026	12.0	920	10.2	94.0	4.1	-	-	0	1720	110
03 12 65	1035	12.0	208	11.2	103.0	3.9	6.40	-	10	13000	1720
03 15 65	1034	14.0	1630	10.8	104.0	3.8	6.20	-	8	7900	3300
03 19 65	1014	14.0	1400	8.8	85.0	3.4	6.60	-	5	7900	3300
03 22 65	1030	11.0	750	10.0	90.0	5.0	6.30	-	2	1300	-
03 26 65	1100	17.0	680	8.2	84.0	3.2	6.40	-	3	700	330
06 03 65	0920	26.0	-	5.8	71.0	2.1	7.00	-	12	17200	170
06 07 65	1025	25.0	-	5.0	60.0	0.0	6.70	-	7	4600	330
06 09 65	1025	24.0	-	6.6	78.0	2.2	6.50	-	16	92000	4600
06 11 65	1015	24.0	-	5.4	64.0	2.0	6.30	-	13	22000	2000
06 15 65	1015	25.0	-	5.1	61.0	-	6.60	-	10	24000	490
07 19 65	0945	30.0	-	5.7	75.0	2.6	7.00	-	5	16000	3100
07 21 65	1005	29.0	-	6.4	82.0	1.3	5.50	-	5	-	-
07 23 65	0948	28.0	-	5.8	73.0	1.6	6.80	-	5	-	-
07 27 65	1000	26.0	23	5.3	65.0	4.0	6.90	-	-	160000L	54200
07 29 65	0940	27.0	-	6.4	79.0	1.7	6.70	-	6	130000	7000

RETRIEVAL DATE: 01/04/66

274940
TALLAHOMA CR 1 MI W LARUEL CO RD
MISSISSIPPI
SOUTHEAST
PASCAGOULA
AGENCY: 603200 TYPE: 002

DATE FROM TO	TIME OF DAY	00003 VSAMPLOC DEPTH FEET	00070 TURB JKSN JU	00095 CNDUCTVY AT 25C MICROMHO	00340 COD HI LEVEL MG/L	00900 TOT HARD CACO3 MG/L	00910 CALCIUM CACO3 MG/L	00920 MGNSIUM CACO3 MG/L	01045 IRON TOTAL UG/L	01055 MANGNESE MN UG/L	31677 STPCOCCI AD-EVA BR-100ML
02 23 65	1229	-	-	-	-	18	14.0	4.0	-	-	-
02 25 65	1055	-	-	-	-	8	6.0	2.0	-	-	-
02 26 65	1000	-	-	-	-	28	12.0	14.0	-	-	-
03 01 65	1105	-	-	-	-	18	8.0	10.0	-	-	-
03 02 65	0947	-	-	-	-	10	8.0	2.0	-	-	-
03 03 65	1004	-	-	-	-	14	10.0	4.0	-	-	-
03 04 65	1043	-	-	-	-	16	14.0	2.0	-	-	-
03 05 65	1051	-	-	-	-	32	10.0	22.0	-	-	-
03 08 65	1052	-	-	-	-	22	18.0	4.0	-	-	-
03 09 65	1032	-	-	-	-	20	14.0	6.0	-	-	-
03 10 65	1030	-	-	-	-	20	14.0	6.0	-	-	-
03 11 65	1026	-	-	-	-	20	12.0	8.0	-	-	-
03 12 65	1035	-	-	-	-	22	12.0	10.0	-	-	-
03 15 65	1034	-	-	-	-	16	10.0	6.0	-	-	-
03 19 65	1014	-	-	-	-	18	10.0	8.0	-	-	-
03 22 65	1030	-	-	-	-	20	12.0	8.0	-	-	-
03 26 65	1100	-	-	-	-	24	16.0	8.0	-	-	-
06 03 65	0920	-	-	80	-	24	18.0	6.0	-	-	-
06 07 65	1025	-	-	64	-	28	18.0	10.0	-	-	-
06 09 65	1025	-	-	60	-	-	12.0	-	-	-	-
06 11 65	1015	-	-	65	-	-	12.0	-	-	-	-
06 15 65	1015	-	-	100	-	-	16.0	-	-	-	-
07 19 65	0945	-	-	65	-	-	-	-	10	0.0	-
07 21 65	1005	-	-	80	-	28	18.0	10.0	-	-	-
07 23 65	0948	-	-	-	-	32	22.0	10.0	-	-	-
07 27 65	1000	-	-	-	-	-	-	-	-	2.0	-
07 29 65	0940	-	-	50	-	16	12.0	4.0	-	-	-


70
60
50
40
30
20
10
HOURS
STA. 3
STA. 4
STA. 6
STA. 7
STA. 8
STA. 9
TIME TO STA. 9 = 88 HRS.
EST. TIME TO STA. 10 (MILE 0) ≈ 112 HRS.
Q≈26 CFS AT STA. 3
Q≈244 CFS AT STA. 9
EST. TIME TO STA. 10 (MILE 0) ≈ 73 HRS.
Q≈235 CFS AT STA. 3
≈1100 CFS AT STA. 9
EST. TIME TO STA. 10 (MILE 0) ≈ 45 HRS.
Q≈1100 CFS AT STA. 3
≈2200 CFS AT STA. 9
50
40
MILES ABOVE MOUTH
30
20
10
5
APP. II
FIGURE A
DEC. 1965
SOUTHEASTERN COMPREHENSIVE WATER POLLUTION CONTROL PROJECT
TALLAHALA CREEK
TIME OF TRAVEL FROM STA. 3
U.S. DEPARTMENT OF HEALTH, EDUCATION, & WELFARE
PUBLIC HEALTH SERVICE
REGION IV
ATLANTA, GEORGIA


B.O.D.
DAYS
SECOND STAGE
4.5
FIRST STAGE
2.6
k_1=0.092
APP. II
FIGURE B
DEC. 1965
SOUTHEASTERN COMPREHENSIVE
WATER POLLUTION CONTROL
PROJECT
TALLAHALA CREEK
LONG TERM BOD
STA. 3 7/21/65
U S DEPARTMENT OF HEALTH, EDUCATION, & WELFARE
PUBLIC HEALTH SERVICE
REGION IV
ATLANTA, GEORGIA
1065

APPENDIX 3

GROUND WATER QUALITY DATA

Table A

Chemical analyses of water from wells in the Pascagoula River basin 1/
(Constituents are in parts per million)

DATE MO/DAY/YR	Depth (ft)	Dissolved solids	pH	Silica (SiO_2)	Total iron (Fe)	Hardness as $CaCO_3$	Sodium (Na)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Flouride (F)	Nitrate (NO_3)
JASPER COUNTY												
Dec. 1962	265	187	7.0	4.0	1.0	147	[b]15	184	17	6	0.1	
Aug. 1961	404	528	8.0	14	.1	168	[b]128	286	102	73	.1	
May 1955	652	420	7.4	12	.26	14	142	230	73	40	.7	0.3
Dec. 1962	341	366	7.1	4.4	.1	177	[b]70	238	71	41	.1	
Apr. 1952	864	355	8.7		0	0	[b]154	348	8.2	5	.1	
Apr. 1955	360	418	8.5	11	.08	9	152	287	56	30	.1	1.1
JONES COUNTY												
May 1955	46	50	6.8		1.2	19	2.1	22	0.6	4.0		2.0
July 1955	120	35	5.9		2.1	12	2.8	12	3.0	2.5		.0
May 1955	235	112	6.9	17	.67	37	12	62	11	3.2		.4
July 1955	78	47	6.0		12	18	4.3	17	8.0	3.5		.1
May 1955	158	46	6.4		2.4	28	2.0	34	1.0	3.0		.3
Apr. 1955	640	556	8.6		.32	1	218	429	49	28	2.0	2.6
May 1955	70	134	7.0	27	4.0	15	21	65	10	2.8		1.8
do	126	236	8.4		.32	43	64	194	12	4.2		.5
Mar. 1955	76	86	7.9		.41	46	6.2	64	6.2	4.0		.0
do	210	296	8.5		.17	14	110	250	19	4.2		1.2
do	226	141	7.0	35	.25	34	18	78	8.2	4.0		.6
Feb. 1964	326	183	7.7	39	.04	2	59	140	9.6	2.7	.3	.0
do	549	174	7.6	59	.07	9	46	112	12	2.3	.1	.0
July 1943	190	120	7.3	17	.65	57	20	103	9.1	4.4	.0	.0

1/ from USGS Report "Geology & Groundwater Resources of Pascagoula River Basin" 1965

APPENDIX 4

ECONOMIC DATA AND PROJECTIONS

Number	Title
Table A	Population Projections, Upstream Areas
B	Population Projections, Pascagoula Main Stem
C	Projection of Economic Parameters
D	Projection of Employment, Tallahala Creek Area
E	Project of Employment, Magee-Collins Area

TABLE A
POPULATION PROJECTIONS
UPSTREAM AREAS

Year	Jasper	Jones[1/]	Subtotal	Simpson	Covington	Lamar	Forrest	Subtotal	Total
				Rural-Farm Population					
1960	5,800	6,794	12,594	6,874	6,642	2,933	1,654	18,103	30,697
1965	4,600	5,400	10,000	6,000	5,600	2,400	1,300	15,300	25,300
1980	2,800	3,500	6,300	3,600	2,700	1,900	1,200	9,400	15,700
2015	2,100	2,600	4,700	2,800	2,000	1,500	900	7,200	11,900
				Urban and Rural-Nonfarm Population					
1960	11,109	52,748	63,857	13,580	6,995	10,742	51,068	82,385	146,242
1965	12,500	55,800	68,300	14,000	7,700	10,800	53,200	85,700	154,000
1980	18,200	66,800	85,000	17,000	10,300	12,200	61,900	101,400	186,400
2015	45,100	108,000	153,100	24,200	22,900	26,500	100,700	174,300	327,400
				Total Number of Inhabitants					
1960	16,909	59,542	76,451	20,454	13,637	13,675	52,722	100,488	176,939
1965	17,100	61,200	78,300	20,000	13,300	13,200	54,500	101,000	179,300
1980	21,000	70,300	91,300	20,600	13,000	14,100	63,100	110,800	202,100
2015	47,200	110,600	157,800	27,000	24,900	28,000	101,600	181,500	339,300

[1/] The future Laurel SMSA includes all concentrations of population within Jones County (Ellisville, etc.).

TABLE B

POPULATION PROJECTIONS
PASCAGOULA MAIN STEM

Year	George	Jackson	Total
	Rural-Farm Population		
1960	3,046	1,013	4,059
1965	2,700	900	3,600
1980	1,700	800	2,500
2015	1,400	700	2,100
	Urban and Rural-Nontarm Population		
1960	8,052	54,509	62,561
1965	9,800	66,900	76,700
1980	16,300	109,600	125,900
2015	23,600	303,300	326,900
	Total Number of Inhabitants		
1960	11,098	55,522	66,620
1965	12,500	67,800	80,300
1980	18,000	110,400	128,400
2015	25,000	304,000	329,000

TABLE C

PROJECTION OF ECONOMIC PARAMETERS

Year	Jasper-Jones County Area[1/]	Simpson-Forrest County Area[2/]	George-Jackson County Area[3/]
		Total Employment	
1960	23,600	31,100	18,400
1965	24,500	31,600	22,500
1980	29,400	35,700	36,000
2015	52,000	60,000	101,000
		Number of Households	
1960	20,400	26,900	17,400
1965	21,500	27,700	21,400
1980	26,500	32,200	35,800
2015	48,000	55,000	100,000
		Personal Income (Thousands of 1962 Dollars)	
1960	105,200	138,300	92,800
1965	125,600	162,000	131,900
1980	207,500	251,800	294,300
2015	655,000	753,000	1,415,000

1/ Laurel, Mississippi, is major population and growth center.

2/ Hattiesburg, Mississippi, is major population and growth center.

3/ Pascagoula, Mississippi, is major population and growth center.

TABLE D

PROJECTION OF EMPLOYMENT
TALLAHALA CREEK AREA

Industry Group		Estimated Employment			
SIC Code	Abbreviated Name	1960	1965	1980	2015
Div. D	Manufacturing	5,900	6,100	7,600	13,100
2011 & 13	Meat and Sausage	60	110	150	280
2015	Poultry	130	230	650	900
2022, 24 & 26	Natural cheese, Ice cream, & Fluid milk	110	120	160	370
2032, 33 & 35	Canned specialties, Canned & Pickled fruits and vegs.	80	100	130	390
2086	Bottled and canned soft drinks	90	90	110	190
2094	Grease & tallow (renderers)	20	30	40	80
2097	Manuf. ice	40	40	50	110
2251	Full-fashioned hosiery	100	20	30	50
2499	Wood products, n.e.c.[1/]	3,300	3,400	4,000	8,000
	Total, major water-using industries	3,930	4,140	5,320	10,370

[1/] Wood products not elsewhere classified (principally Masonite).

TABLE E

PROJECTION OF EMPLOYMENT
MAGEE-COLLINS AREA

Industry Group		Estimated Employment			
SIC Code	Abbreviated Name	1960	1965	1980	2015
Div. D	Manufacturing	540	740	840	1,400
2011 & 13	Meat and Sausage	30	50	70	140
2015	Poultry	220	400	430	860
Total, major water-using industries		250	450	500	1,000

TABLE F

PROJECTION OF EMPLOYMENT
HATTIESBURG AREA

Industry Group		Estimated Employment			
SIC Code	Abbreviated Name	1960	1965	1980	2015
Div. D	Manufacturing	3,700	4,400	5,200	8,600
2011 & 13	Meat and Sausage	120	150	300	550
2015	Poultry	100	130	190	390
2022, 24 & 26	Natural cheese, Ice cream & Fluid milk	20	20	30	70
2086	Bottled and canned soft drinks	70	80	90	150
2097	Manufactured ice	10	10	10	30
2861	Gum and wood chemicals	1,040	1,020	1,070	1,600
3321	Gray iron foundries	30	30	70	110
Total, major water-using industries		1,390	1,440	1,760	2,900

APPENDIX 5

CORRESPONDENCE CONCERNING QUALITY
REQUIREMENTS OF CALLAHALA CREEK

COPY OF STATEMENT

STATEMENT OF MASONITE CORPORATION
CONCERNING THE PROPOSED TALLAHALA CREEK RESERVOIR
IN THE PAT HARRISON WATERWAY DISTRICT TO THE
UNITED STATES PUBLIC HEALTH SERVICE
SEPTEMBER 24, 1965

The future use of water in Tallahala Creek is vitally important to the continued success of the Masonite operation at Laurel and to the well-being of our community. After flood control, the two uses of primary interest to us are industrial water supply and disposal of the natural wood extractives which are a by-product of our process.

Our net usage of water is approximately 7.5 million gallons per day supplied from our own wells, mostly from a depth of about 200 feet. The level of that stratum has been dropping for the last eight years by an average of about three feet per year. Last year we had to drill and place in operation four new wells.

I understand the Tallahala Creek Reservoir could improve our ground water supply and stop this steady drop in our water table. If not we would need water stored in the reservoir to the extent that ground water is no longer available to us. In either case, the reservoir will help to supply the 7.5 million gallons we need, though we have no idea how much storage should be provided in the reservoir to protect this need.

The reservoir itself will be a fine new recreational facility and will benefit and enhance our area because of the fishing and water sports that will be available on the lake to the public. We believe that use of the reservoir for that purpose should be emphasized. Usage of the creek below the reservoir to the Leaf River should be directed mainly to industrial needs. Adequate controls should be provided for protection of health and for the maintenance of fish and other aquatic life in the Leaf River. Stream flow should be provided to allow controlled release of process effluent from our plant into the creek to provide a minimum acceptable D.O. in Leaf River at and below its confluence with Tallahala Creek. We feel this would provide a fair and equitable use of the stream system and would take care of the industrial needs as well as meeting flood control, recreation, conservation, and other objectives.

Dean B. Thatcher
Vice President & General Manager
of Mississippi Operations

JONES COUNTY HEALTH DEPARTMENT
HEALTH CENTER BUILDING
Cooperating with
MISSISSIPPI STATE BOARD OF HEALTH
Laurel, Mississippi

October 18, 1965

Mr. John W. Wakefield, Director
Southeastern Comprehensive Water
Pollution Control Project
Department of Health, Education
and Welfare Regional Office IV
Room 404 50 Seventh St., N. E.
Atlanta, Georgia

Dear Mr. Wakefield:

It is my opinion that water quality in Tallahalla Creek should be maintained suitable for the propagation of fish in all reaches, at all times, if practical from an engineering standpoint and if economically feasible.

Yours truly,

Grady B. Hamilton

Grady B. Hamilton
Sanitarian

GBH:dvs

JULIUS W. KING
Oil Properties

P. O. Box 663 - Telephone 426-9707
311 Fifth Avenue
LAUREL, MISSISSIPPI

October 19, 1965

Mr. John Wakefield
Dept. of Health, Education & Welfare
Room 404, 50 Seventh St., N. E.
Atlanta, Georgia

Dear Mr. Wakefield:

I enjoyed meeting with you on Friday, September 24, at the Magnolia Motor Lodge with the Jones and Jasper County Area Group concerned with the natural water situation in our area.

I feel that our water in Tallahala Creek should be maintained if at all possible so that we might have fish and wild life at all times, if it is possible to do so from an economical and engineering standpoint. I hope that your group will be able to lend us assistance, because it appears that we will be unable to accomplish this desired situation in the future without your help.

With kindest regards.

Yours very truly,

JULIUS W. KING

JWK:dt

cc: Swep T. Davis
Pat Harrison Waterway Commission
Hattiesburg, Mississippi

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Game & Fish Commission

STATE OF MISSISSIPPI

COMMISSIONERS

RAY R. CANNADA, CHAIRMAN
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TOM RIDDELL, JR., VICE CHAIRMAN
CANTON

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JOHN P. CAMP, JR.
ASST. EXEC. DIRECTOR

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Dr. I. W. BUSH
NORTH CARROLLTON

STEVE T. MISTILIS
OXFORD

P. O. BOX 451 • PHONE 355-9361
Jackson, Mississippi 39205

October 20, 1965

Mr. John W. Wakefield, Director
Southeastern Comprehensive Water
Pollution Control Project
Department of Health, Education
and Welfare Regional Office IV
Room 404, 50 Seventh Street N. E.
Atlanta, Georgia 30323

Dear Mr. Wakefield:

Reference is made to the meeting held in Laurel, Mississippi, on Friday, September 24, 1965, concerning the desired water quality in Tallahala Creek.

We feel that the water quality in Tallahala Creek should be maintained in such a way that it will be suitable for the production of fish and fish food organisms at all times. This goal is a little nearer now that the city of Laurel has their lagoon in operation. We hope that the Masonite Corporation will be doing a little better job on their effluent in the very near future.

With the able assistance of your Department, we believe that this may be accomplished so that this stream will once again be turned into a productive body of water.

Very truly yours,

Barry O. Freeman
Chief of Fisheries

BOF:nj

PERRY COUNTY INDUSTRIAL COUNCIL

New Augusta, Mississippi

October 26, 1965

Mr. John W. Wakefield, Director
Southeastern Comprehensive Water
Pollution Control Project
Department of Health, Education
and Welfare Regional Office IV
Room 404, 50 Seventh St., N.E.
Atlzanta, Georgia 30323

Dear Mr. Wakefield:

I am writing you with reference to the meeting I attended in Laurel, Mississippi, on September 24, 1965, concerning the desired water quality in Tallahalla Creek. It should be maintained suitable for the propagation of fish in all reaches, at all times, if practical from an engineering standpoint and if economically feasible.

I further believe that when this is done to Tallahalla Creek that this will enable the people using the water from the Creek to a more profitable use than here-to-fore.

We strongly endorse the Reservoir on Tallahalla Creek, North of Laurel, Mississippi.

Sincerely yours,

Pettis Walley

Pettis Walley, President
Perry County Industrial Council

PW/bs

ROY McKENZIE, District 1
Vice President of the Board
H. L. JONES, District 3

BURA CONWAY, District 2
President of the Board

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F. T. DEAKLE, District 4
I. A. GARRAWAY, JR., District 5

PERRY COUNTY

RUTH W. CARLEY
Clerk of the Board

JOHN M. DUNNAM, JR.
Attorney for the Board

OFFICE OF
BOARD OF SUPERVISORS
NEW AUGUSTA, MISSISSIPPI

October 28. 1965

Mr. John W. Wakefield, Director
Southeastern Comprehensive Water
Pollution Control Project
Department of Health, Education
and Welfare Regional Office IV
Room 404, 50 Seventh St., N.E.
Atlanta, Georgia 30323

Dear Mr. Wakefield:

We the Board of Supervisors of Perry County, Mississippi, who attended the meeting in Laurel, Mississippi, on September 24, 1965, with reference to the proposed Reservoir on Tallahalla Creek.

It is the opinion of the Board of Supervisors of Perry County that we believe the construction of this Reservoir to be in the best interest of the citizenry of Jones and Perry County, and we certainly want to urge that the water of Tallahalla Creek be freed of pollutions so that it would make the water of the Creek usable by the citizens living south of the Reservoir and adjacent to Tallahalla Creek.

We therefore endorse the construction of the Reservoir on Tallahalla Creek, North of Laurel, Mississippi.

Sincerely yours,

Roy McKenzie
Board of Supervisor, Beat 1

Bura Conway
Board of Supervisor, Beat 2

H. L. Jones
Board of Supervisor, Beat 3

I. A. Garraway
Board of Supervisor, Beat 5

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CITY OF LAUREL, MISSISSIPPI

MAYOR
HENRY BUCKLEW

WATER COMMISSIONER
C. A. MASSEY

STREET COMMISSIONER
T. A. BLACKLEDGE

October 28, 1965

Mr. John W. Wakefield, Director
Southeastern Comprehensive Water
Pollution Control Project
Department of Health, Education
and Welfare Regional Office IV
Room 404, 50 Seventh Street, N. E.
Atlanta, Georgia 30323

Dear Mr. Wakefield:

Forgive me for the delay in writing concerning my feelings about the use of the water in Tallahalla Creek.

It is my honest opinion that all water in Tallahalla should be maintained suitable for the propagation of fish in all reaches, at all times, if practical from an engineering standpoint and if economically feasible.

You all were extremely kind to come visit with us in Laurel and please be assured that I will cooperate fully to help expedite this vitally needed project for all the people of this area.

Gratefully yours,

Henry Bucklew

Henry Bucklew
Mayor

HB/jh

ROBERT L. LASSITER
PERRY COUNTY
ROUTE 2
RICHTON, MISSISSIPPI

MISSISSIPPI
HOUSE OF REPRESENTATIVES
JACKSON

COMMITTEE ASSIGNMENTS:
LIVESTOCK & POULTRY, VICE CHAIRMAN
AGRICULTURE
COUNTY AFFAIRS
FEES & SALARIES
PENSIONS & SOCIAL WELFARE

November 5, 1965

Mr. John Wakefield, Director
Room 404, 50 Seventh Street, N.E.
Atlanta, Georgia

Dear Mr. Wakefield:

It is my opinion that Water Quality in Tallahalla Creek should be maintained suitable for the Propagation of fish in all reaches, at all times, if Practical from an engineering standpoint and if economically feasible.

Sincerely,

Robert L. "Bob" Lassiter

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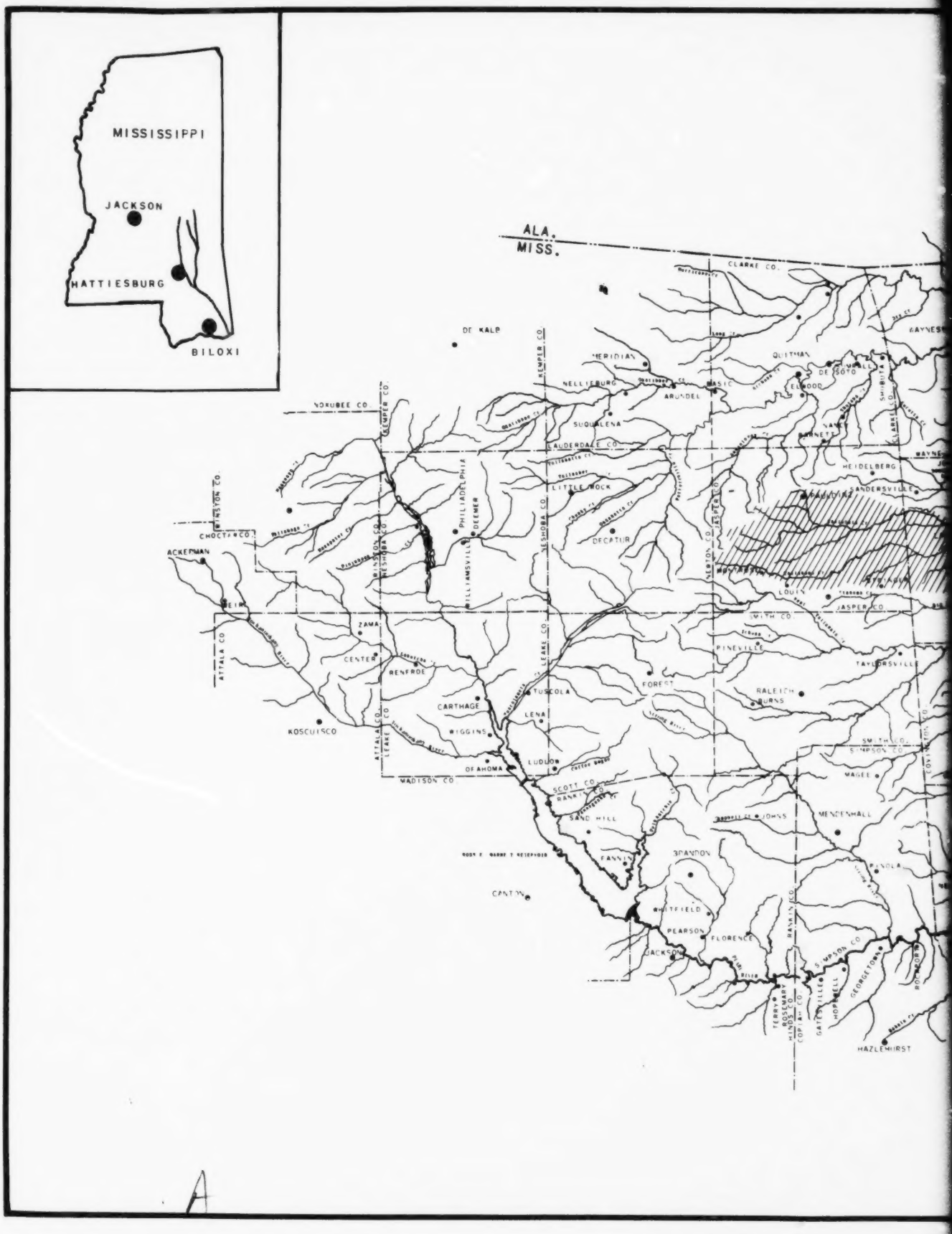
MISSISSIPPI
JACKSON
HATTIESBURG
BILOXI
ALA.
MISS.
CLARKE CO.
DE KALB
KEMPER CO.
NOXUBEE CO.
MERIDIAN
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DIEMER
WINSTON CO.
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ACKERMAN
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DECATUR
LOUIN
JASPER CO.
SMITH CO.
ZAMA
CENTER
RENFROE
ATTALA CO.
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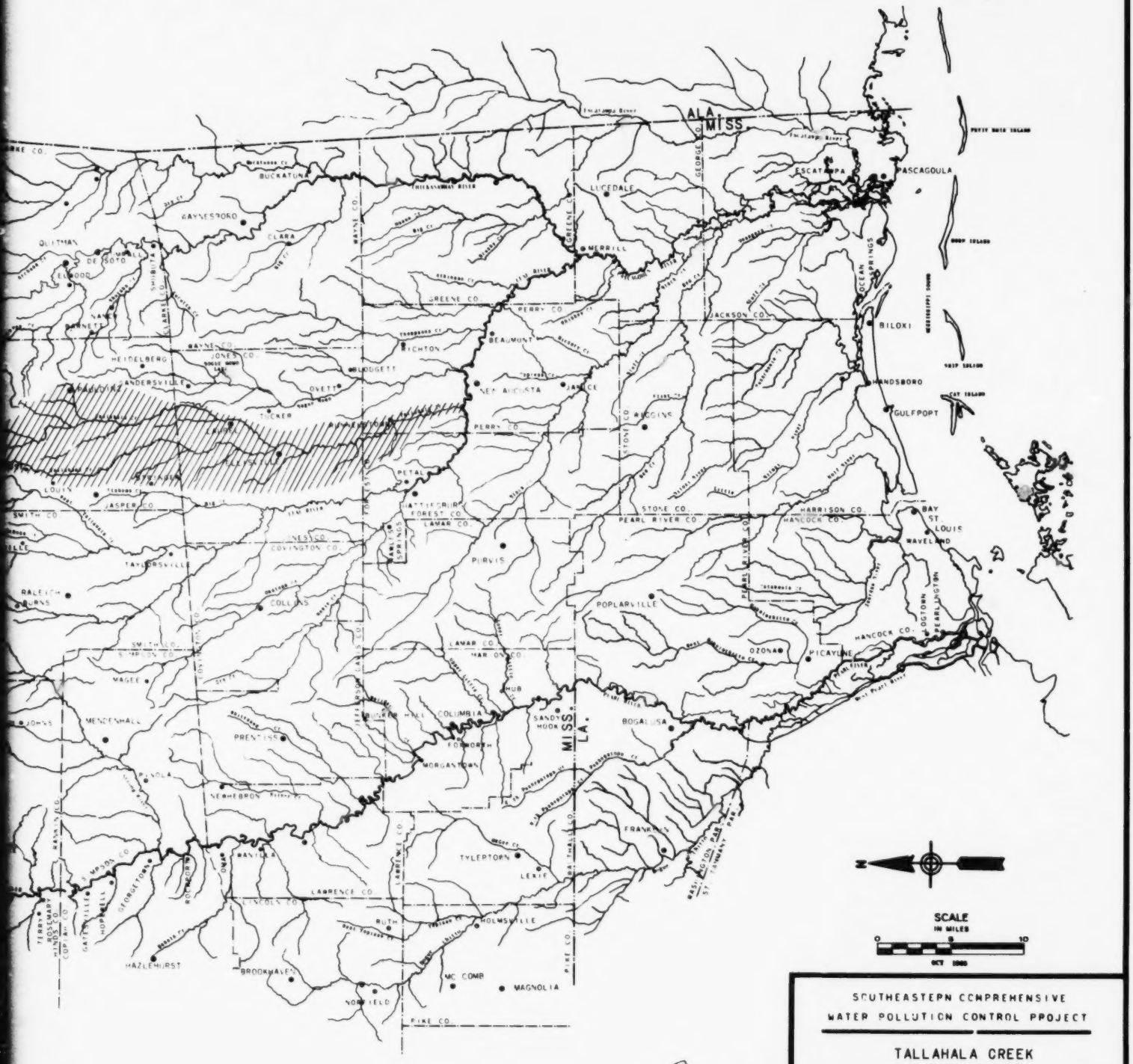
PINEVILLE
TAYLORSVILLE
FOREST
RALEIGH
BURNS
TUSCOLA
CARTHAGE
LENA
KOSCIUSCO
HIGGINS
LUDLOW
OAKOMA
MADISON CO.
SCOTT CO.
RANKIN CO.
SIMPSON CO.
MAGEE
SAND HILL
JOHNS
MENDENHALL
BRANDON
PEARL
CANTON
WHITFIELD
PEARSON
FLORENCE
JACKSON
RANKIN CO.
SIMPSON CO.
GEORGETOWN
HAZLEHURST
A



SOUTHEASTERN COMPREHENSIVE
WATER POLLUTION CONTROL PROJECT

TALLAHALA CREEK
VICINITY MAP

U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Public Health Service
REGION IV ATLANTA, GEORGIA

FIGURE 1

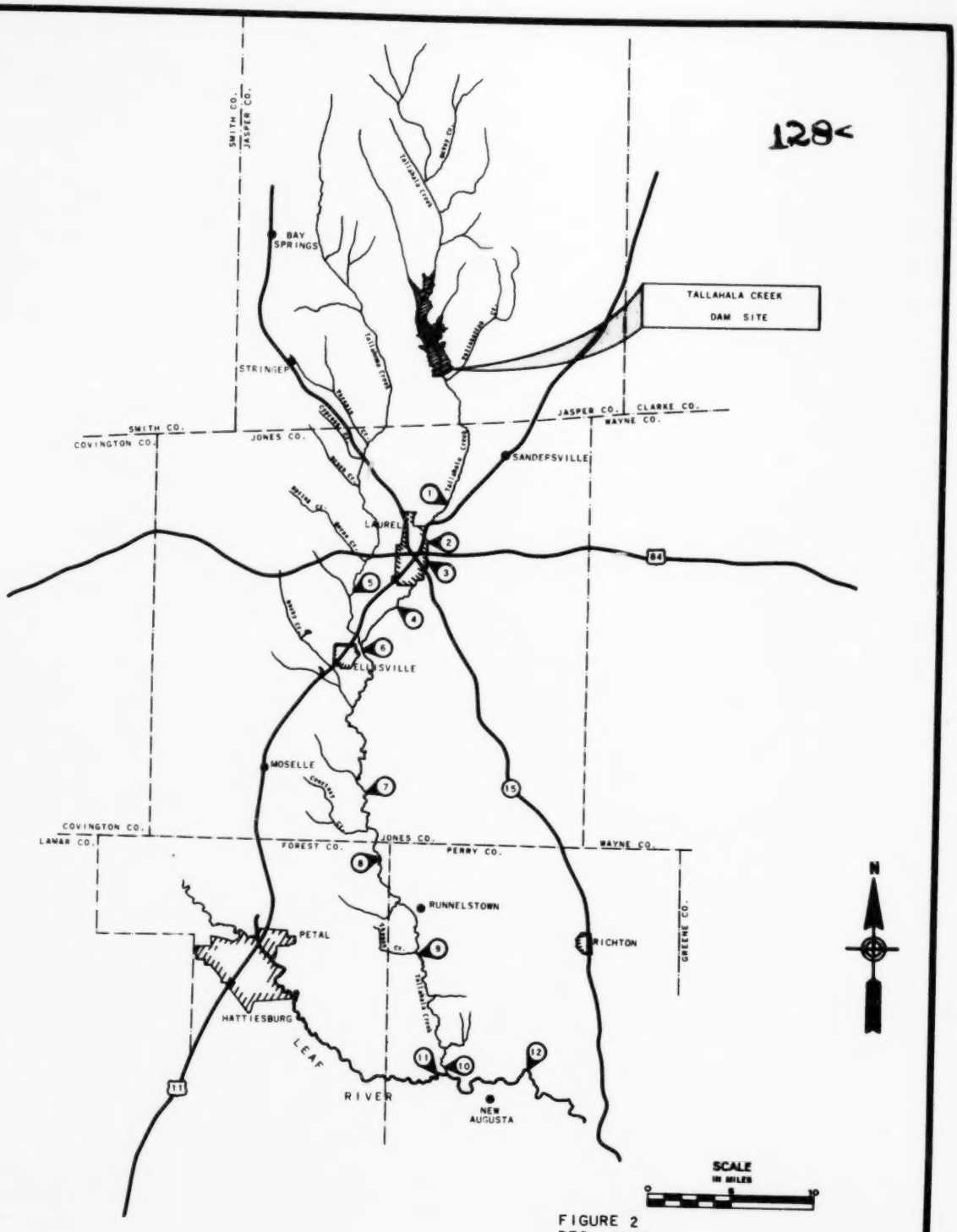


FIGURE 2
DEC. 1965

SOUTHEASTERN COMPREHENSIVE WATER POLLUTION CONTROL PROJECT

TALLAHALA CREEK
SAMPLING STATION LOCATIONS

U.S. DEPARTMENT OF HEALTH, EDUCATION, & WELFARE
PUBLIC HEALTH SERVICE
DIVISION OF WATER SUPPLY & POLLUTION CONTROL
REGION IV ATLANTA, GEORGIA